

PLANNING THE COUNTRYSIDE

FIRST REPORT

BY

RADHAKAMAL MUKERJEE

ECONOMIC ADVISER

GWALIOR GOVERNMENT

WITH ILLUSTRATIONS BY
PRABHAT NIYOGI



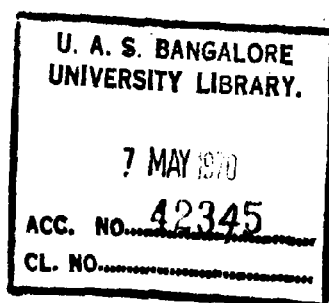
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PREFACE

In May last year I was asked by H. H. the Maharaja Scindia to take up the appointment of Economic Adviser of Gwalior State for the preparation of an Economic Plan for Gwalior and determination of priorities of various schemes and measures that have been submitted by the different Heads of Departments to the Post-War Reconstruction Department. This Report is the outcome of my labours in this regard supplemented by results of my economic surveys in the various parts of the Gwalior State. An integrated Plan of Development of the countryside of Gwalior is embodied in this First Report. The Draft Scheme deals with separate piecemeal projects. Further, Pilot Projects are visualized that cover and co-ordinate planning activities in agriculture, sanitation, education, marketing, forestry and 'panchayat' organization. These have received the sanction of the Gwalior Durbar and are now actually being implemented in two circles of 10 to 15 villages each. The Pilot Project with its targets for different developmental activities will lead and guide an over-all co-ordinated drive for economic development in the State.

The Second Report will deal with the planning of industry.

This Economic Plan for Gwalior, we venture to say, will elicit interest outside the State. For the first time, targets for agriculture, nutrition, standard of living, health, and literacy are precisely calculated and fixed, and reached by the necessary developmental plans in various fields. These may be adopted with little modification by other Provinces and States in India. Organizations and agencies for improvement of public health, liquidation of illiteracy, rural industrialization and agricultural co-operation that have been suggested here could also be adopted with advantage in other parts of the country.

Planning also includes the determination of priorities. With the masses of the population in India living in utter

poverty, insecurity, ignorance and despair, the scale of priorities in all parts of the country will be almost the same. The top priority will belong everywhere in India to protective rather than developmental measures—protection against diseases, drought, pest, or loss of fertility and moisture of land ; and protection against eviction, usury, and different forms of social and economic bondage and exploitation. Only on the basis of certain essential freedoms from want and fear, can fresh developmental activities towards the improvement of living standards and amenities of life and comfort be envisaged. There is a tendency in India now to put the cart before the horse—to push the claims of industrialization above the elementary needs of protection, ease and security of living for the people. It is their modicum of amenities, leisure and capacity for enjoyment as well as purchasing power, which alone can support industrialization.

Let us not delude ourselves in India that all or most economic planning is industrialization. With a chronic food shortage in the country and the need in Gwalior of an over-all increase of about 73 per cent in agricultural production in order to attain an adequate standard of balanced diet for all, improvement of agriculture is the first indispensable step for reaching the targets of health, leisure and welfare for the common man. India's tempo of progress in planning is limited by her progress in scientific farming represented by peasant holdings rather than collective farms and by the capacity of peasant farmers for co-operative organization, socialized living and family limitation. On the other hand, planned industrialization would give an impetus to rural improvement by providing cheap fertilizers, tractors, pumps, other agricultural machinery and hydel power and also establish the much-needed parity between agricultural and industrial prices—so that the present gulf between rural and urban standards of living may be gradually reduced. Planning in an agricultural country must adopt the mechanism of price control not only for safeguarding fair prices for the major cereals but also for stabilizing such ratio between the prices of agricultural and of industrial commodities so

that gradually the rural standard of living approximates to the urban.

The emphasis is equally necessary for both pitching up the targets of production and for securing an equitable distribution of income and opportunities, for both increase of income and establishment of a reasonable parity of income between the different social classes and groups of producers and consumers. As a matter of fact the latter objective has received much less attention than it deserves in the Plans so far published. Planning has no meaning in India without the improvement of an over-all security, leisure and standard of living for the common people.

This can only be achieved by the all-round improvement of agricultural production, the establishment of a favourable exchange between agricultural produce and cloth, salt, sugar, kerosene and other articles of consumption and comfort, and the intensive development of rural public works and social services like public health, education, recreation, in the countryside. All these have been given their due scale of importance in this Plan.

Both the aims and targets of planning must also change as the Plan progresses from period to period satisfying the top priorities earliest and taking up gradually other priorities that were low in the scale in the initial stages. Just as the Plan has to be conceived dynamically, there should also be a revision of both targets and priorities as the Nation advances step by step towards all-round technical and social efficiency and welfare.

Moti Mahal
Rama Navami
May, 1946

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RADHAKAMAL MUKERJEE

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CHAPTER I

PLANNING FOR THE PEOPLE

Planning is the utilization of modern technological science and social knowledge for the improvement of the life of the individual and society. It is both a delicate and a comprehensive art ; it implies the co-ordination of the various developmental activities of the Government. In fact proper co-ordination is the crux of planning. Numerous planning departments have come into being and each tends to work in a water-tight compartment, issuing directions and making propaganda for its own branch of the plan without considering the cumulative effect of the work of several such departments. The result might well be a conflict of directives and propagandas, hampering progress and befuddling the subject of the plan, namely, the ignorant villager.

Developmental activities carried on in isolation, however efficiently, bear with them the seeds of their own disorganization and stultification. A plan which blindly adopts modern scientific methods of agriculture that bear no relation to the size of the cultivator's holding, the facilities for irrigation, the volume of indebtedness, the quality of cattle, or the methods of marketing, is bound to end in failure. Our development plans should make full allowance for the limitations of the environment under which we have to work and must aim at a co-ordinated improvement of all those factors which condition our agriculture—irrigation, the sizes of holdings, the extent of bullock-power, and the habits of thrift and toil among the cultivators. It is only the co-ordinated programme which brings into focus the whole life of the individual that can ensure success.

The villagers cannot make progress in one aspect of life and continue to remain conservative, ignorant and superstitious in others. Progress-mindedness in one direction

is indeed incompatible with indifference and lack of enterprise in others.

A system of planning in order to succeed must not only concentrate on the elimination of the major drawbacks and limitations of the people, but also avoid schemes and projects that shoot over their heads. The schemes and ideals should not be pitched too high, but conform to the social consensus and background of the villages. Further, the developmental activities of the State in countryside planning should enlist the co-operation and evoke the enthusiasm of the rural population in order that quick results may be forthcoming.

The improvement of agriculture through the dissemination of improved seeds and the use of manures can be materially aided by the improvement of cattle and the development of irrigation facilities, and the improvement of fuel supplies without which the cultivators will continue to burn cowdung, their best manure. More efficient and improved cattle effect deeper tillage and make important food-materials and other sources of income available to the cultivator's family, which soon realizes the benefits of good breeding and adequate feeding of cattle and can afford to purchase breeding bulls and agricultural appliances. With village groves planted and tended with care, the much-needed animal manure need no longer be used as fuel and the agricultural out-turn will increase ; also the supply of timber from the village forests will improve the standard of housing. Further, with improvement of health and sanitation, and liquidation of illiteracy, a new ambition will be enkindled for progress, which supplies the much-needed incentive for a mass uplift. Economic planning can start only with the awakening of the general will of the people for better living. Without this even the most carefully devised plans will miscarry.

To awaken the ambition for progress among the rural masses, a new social foundation, the cultivation of a new social attitude, a new social conscience is essential. In the modern age the benefits of science and civilization are largely confined to the upper classes and the urban dwell-

lers. The village is still in the medieval age. Caste restrictions, untouchability, bondage and servility of the agricultural labouring classes have combined to smother initiative and the desire for improvement. The planning of the countryside depends largely upon the will to improve. This can be nursed by the abolition of untouchability and segregation, and by breaking the social and economic bondage of large sections of agricultural workers who in spite of modern laws are usually still found tied hand and foot to the gate-posts of money-lenders and landlords. Social reform is more difficult to achieve than economic reform. The latter is made easier and quicker by the former in any rural planning.

It is a happy augury for the economic planning of Gwalior State that His Highness has begun his rule with the abolition of caste distinctions in the use of public wells and has encouraged temple entry for the untouchables ; but social usage still combats and nullifies the law of the State. Rural public opinion should be educated and mobilized for the removal of social distance between class and class which saps the morale of considerable sections of the population.

In the rural areas, landlords and village panchayats should see to it that there is no distinction of caste in the use of wells, that groups of people are not compelled to fetch drinking-water from a distance of several miles, under the blazing sun. Boys of all castes should have free entry in the schools, which should encourage much freer social intercourse in the playgrounds than is possible perhaps in the village itself. Now that the Khilaf Warzi Mazduran Act has been annulled, all debts of Halias extending beyond three years should be extinguished. It should be made a penal offence to keep bondservants or serfs who are tied to service in the household or for farm labour by the loans they or their forefathers contracted. Public opinion should be so aroused and focussed on this problem that all money-lenders and landlords declare on a fixed day that they set free all their bondservants as was done sometime back for the Dublas in Bombay Presidency.

A charter guaranteeing the rights of temple and school entry for all castes and enforcing the abolition of 'begar' and debt-bondage should be promulgated as one of the first steps of planning. Newly reclaimed lands should also be set apart and freely assigned to the depressed castes for cultivation. New village sites, burning-ghats and burial-grounds should be provided for them. Special opportunities for their training in crafts and occupations subsidiary to agriculture should also be provided for them. The fact that those who are at the very bottom of the social ladder are the first to receive from planning its message of the dawn of better days to come may by itself work a miracle in the village.

The targets here are both objective or measurable and intangible or not wholly measurable by means of statistics. Economic planning means nothing less than an all-round development of the standard of living and welfare of the population quantitatively measured by the improvement of nutritional, clothing and housing standards and of leisure, literacy and average expectation of life. Progress here has to be measured statistically from five-year plan to five-year plan with reference to certain objective norms or targets that are quantitatively expressed and that may be regarded as constituting an absolute minimum for the living standard in the State.

The author as the Chairman of the Sub-Committee on the Aims and Purposes of the National Planning Committee deduced the targets or norms as follows :

1. *Target of nutrition* : 3,000 to 3,750 calories according to occupations.

This will be available from the proposed diet for an adult worker per day, detailed in TABLE I opposite.

The composition of a well-balanced diet for an adult is given in TABLE II opposite.

2. *Target of clothing* : 45 yards of clothing per annum per adult (India's annual consumption is only 16.1 yards).

TABLE I
Dietetic Target for an adult worker in Gwalior

Calories	..	..	..	..	..	3,000
Protein (in grams)	..	..	..	..	..	85
Fats (in grams)	..	..	..	..	..	60
Carbohydrates (in grams)	..	..	..	..	..	605
Calcium (in grams)	..	..	..	..	..	0.68
Phosphorus (in grams)	..	..	..	..	..	1.32
Iron (in milligrams)	..	..	..	..	..	15
Vitamin A (International units)	..	..	..	..	..	6,000
Vitamin B (in milligrams)	..	..	..	..	..	2
Vitamin C (in milligrams)	..	..	..	..	..	60
Riboflavin (in milligrams)	..	..	..	..	..	1

TABLE II
Standard diet for an adult per day

		Vege- tarian (oz.)	Non-vege- tarian (oz.)
Cereals	.. ..	22	20
Pulses	.. ..	3	3
Ghee and oil	.. ..	2	1.5
Vegetables	.. ..	4	5
Milk	.. ..	8	4
Fruits	.. ..	2	2
Sugar	.. ..	2	2
Meat, fish and eggs	..		3

3. *Target of housing* : 100 sq. ft. of living space in the house *per capita* or 500 sq. ft. per family.

4. *Target of leisure* : 40 hrs. of work per week.

5. *Target of literacy* : All children and adults should be literate except those who suffer from any congenital defects.

6. *Target of health* : An average expectation of life of 45 years, brought about by both preventive measures (sanitation, protected water-supply, vaccination, inoculation,

TARGETS OF THE PLAN



PRESENT CONDITION
2400 Calories per head daily



PROGRESS UNDER THE PLAN
3000 Calories per head daily



16½ Yards per head per year



45 Yards per capita per year



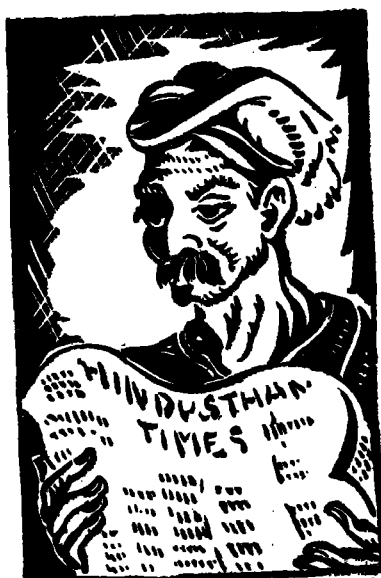
DILAPIDATED HUT



**500 SQ. FEET PER FAMILY-COTTAGE
WITH 2 ROOMS AND A VERANDAH**



8 PERCENT LITERATE



100 PERCENT LITERATE

maternity and child welfare) and curative measures, i.e. proper and adequate medical aid and treatment, as represented by a target of 1 physician, 1 nurse and a dispensary per 1,000 persons.

Other targets cannot be quantitatively expressed fully. These may be briefly put as follows :

(i) *The abridgement of social distance* between groups and classes.

(ii) *The equalization of social and economic opportunities* for all irrespective of caste, creed or community, all these contributing to what Winston Churchill calls 'the fuller life', 'the just and true inheritance of the common man'. Though progress in these directions cannot be precisely estimated, such progress is basic to all economic planning, representing both the goal of planning and the norm according to which it is judged.

The objective and measurable criteria or targets measure the development of the plan from period to period. An economic plan should at its start provide for development for a five-year period. The instalment of each plan should be carefully defined and the achievement of each year, programme by programme, should become the basis of next year's effort. The programme for each year will be envisaged, in specific terms—for instance, of so many acres of land reclaimed from the virgin jungle, so much acreage brought under improved wheat, sugar-cane, rice, groundnut and other crops, so much of reforested land and controlled grazing, of so many consolidated holdings, so many tube-wells, multiple purpose societies, hospitals, dispensaries and schools, of so much reduction of illiteracy and mortality, especially reduction of infant mortality, etc. It is the progress made on all fronts as measured by these various targets, and implemented department by department, that stabilizes the structure and development of the economic plan.

Planning must involve the setting up of a Central Agency for the co-ordinated development and implementa-

tion of the various schemes and policies. It is desirable that the Head of the Planning Department be a Minister of the State. He should be assisted by a Board comprising : (1) the Director of Industries, as envisaged in Scheme No. 25, (2) the Industrial Chemist who should be the head of a Technological Institute or an Industrial Research Laboratory as envisaged in Scheme No. 96 of the Draft Plan, (3) the Director of Agriculture, (4) the Chief Engineer, P. W. D., and (5) an Indian Economist with experience of economic and statistical investigations, who should be Secretary of the Board. This Board should have a permanent staff as envisaged in Scheme No. 22, which deserves, therefore, high priority.

Since an expert personnel is essential for carrying on developmental activities, department by department, a high priority should be given to Scheme No. 24 which provides for training of the staff both abroad and in India, and for the establishment of training institutes in agriculture, forestry, co-operation and veterinary work.

With regard to the district development programme, Scheme No. 44 has to be enlarged and modified so that the entire countryside will be ultimately included in one co-ordinated and concerted drive.

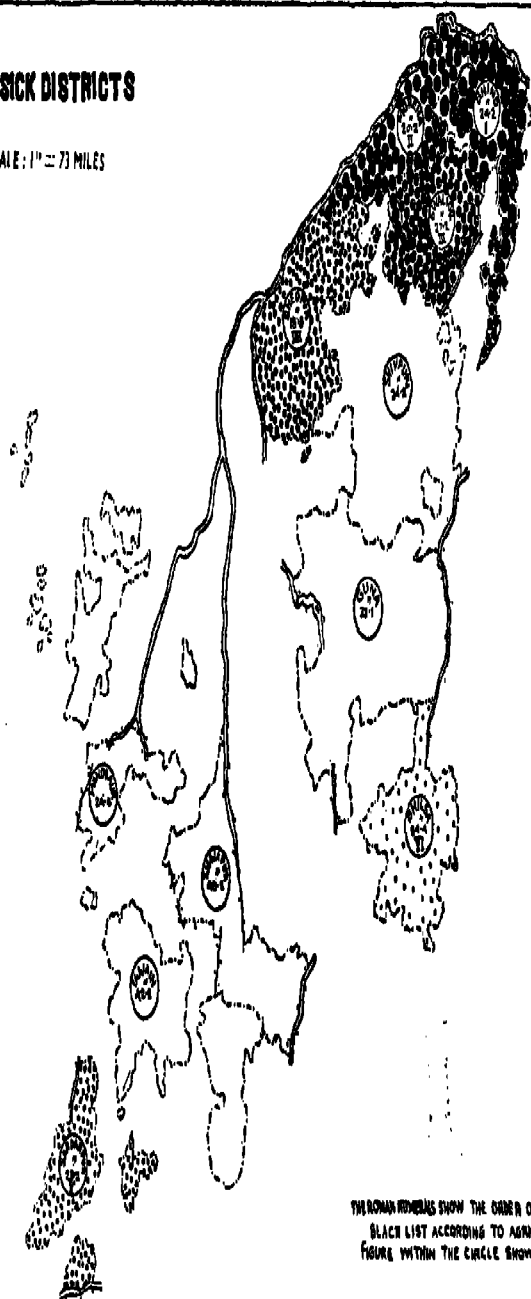
Even with adequate financial resources available, there are two factors limiting the speed of achievement of the plan. First, the period required for the training of expert personnel ; secondly, the time needed to bring about a change in the morale of the people. To allow for these factors and to avoid waste and error on a large scale, the plan should start with Pilot Projects (see Appendix A), one in each of the eleven districts. The Pilot Projects should not be a series of separate departmental schemes as was envisaged in the previous Draft Plan. Each Pilot Project would itself be an integrated plan, but on a small scale, at a selected centre and with well-defined targets in agriculture, sanitation, education, co-operation and rural industrial development. The progress of a Pilot Project would be judged as in the case of the plan itself from five-year period to five-year period but on an experimental scale.

Every one or two years each District Pilot Project will send out personnel trained for planning activities in the several departments—agriculture, sanitation, education, veterinary science, etc. so that the plan will unfold itself from the Pilot Projects, which will meantime rouse that popular enthusiasm on which the success of the plan will ultimately depend.

From the different districts there will be sent out periodically to the Planning Department statements of economic and social progress, giving precise statistical information in respect of advance towards the targets fixed beforehand in different fields. The statistics of today will serve as starting points, and the planned programme, year by year, will furnish both the incentive to and the guidance for the co-ordinated drive. It will be the task of the Planning Department to compare progress in the different districts, supply correctives where movement has become slack, haphazard, or spasmodic ; and direct the efforts of all concerned towards the social and economic targets clearly envisaged and set out in the beginning.

THE SICK DISTRICTS

SCALE: 1" = 75 MILES



THE ROMAN NUMERALS SHOW THE ORDER OF THE DISTRICT IN A
BLACK LIST ACCORDING TO AGRICULTURAL INSECURITY
FIGURE WITHIN THE CIRCLE SHOWS THE AVERAGE RAINFALL

CHAPTER II

THE SICK DISTRICTS OF GWALIOR

Agricultural development in Gwalior is largely a problem of combating the effects of inadequate and unequally distributed rainfall. The average rainfall in Gwalior State is only 31.3 inches ; but more than the inadequacy of rainfall does its capricious distribution tell upon the security of agriculture, since the percentage of cultivated area with irrigation facilities is only 5.6.

In the north of Gwalior we meet with light sand or sand alone and the sub-soil water level is also variable. This makes well-irrigation difficult if not impossible. Canal-irrigation has developed appreciably only in Gird District. Bhind, Gird and Morena show the highest density of population. All the northern districts of Gwalior are susceptible to the effects of droughts and famines. Between 1920 and 1942 inadequate and ill-distributed rainfall caused serious reduction of cropping in 1927-8, 1939-40 and 1941-2.

The period 1921-5 may be taken as a normal and satisfactory one for agriculture in Gwalior State. TABLE III shows the fluctuations of land revenue in Gwalior in the famine years, comparisons being instituted with the average demand and collections for 1921-5, taken as a normal period.

The order of districts according to vulnerability to drought is obtained by comparing the different districts according to rainfall in relation to irrigation facilities and density of population. This is shown in TABLE IV, p. 13.

The districts may now be arranged in a black list of agricultural insecurity as follows :

- | | | |
|-----------|------------|--------------|
| 1. Bhind | 3. Gird | 5. Sardarpur |
| 2. Morena | 4. Sheopur | 6. Bhilsa |

For the above districts the sources of irrigation (1940-41) are shown in TABLE V, p. 14.

TABLE III
Demand and Collection of Land Revenue in Gwalior State

Particulars		Gwalior Gird	Bhind	Morena	Sheopur	Shivpuri	Guna	Bhilsa	Ujjain	Shajapur	Mandsaur	Sardarpur
Average for the quinquennium end- ing 1924-25.	Demand	12,93,894	24,30,363	32,20,706	5,97,057	9,43,292	6,45,688	9,47,585	13,00,519	11,87,319	7,49,276	2,59,135
	Collection	7,94,138	14,83,065	13,91,264	3,76,749	6,48,514	5,65,480	8,91,196	12,45,050	11,32,278	7,31,458	1,76,240
Actual Revenue demand and Col- lections during the famine year 1939-40	Demand	8,74,826	14,91,441	16,06,325	4,55,508	6,64,920	7,76,308	8,28,107	14,19,814	15,14,877	9,76,737	1,45,210
	Collection	8,01,449	13,95,400	13,39,992	1,09,388	6,28,855	6,67,698	7,36,730	13,78,883	15,08,050	9,16,670	1,76,069
Percentage deviation over (+) or below (-) the average (nor- mal) for quin- quennium end- ing 1924-25	Demand	-32.9	-39.7	-50.2	-24.7	-29.9	+20.2	-12.6	+9.2	+27.6	+30.3	-32.3
	Collection	+0.9	-5.9	-3.8	-7.09	-3.1	+18.1	-17.4	+10	+33.2	+25.3	28.3
Actual Revenue demand and col- lection during the famine year 1941-42	Demand	8,42,415	14,82,150	15,24,713	6,46,232	6,57,861	7,71,574	7,89,704	14,05,372	15,12,877	9,78,795	1,77,878
	Collection	1,95,155	6,89,030	4,81,024	2,98,428	5,26,085	6,55,583	7,15,893	13,79,717	14,47,632	9,57,029	1,72,455
Percentage deviation during the famine year 1941- 42	Demand	-34.8	-39.01	-52.66	+7.6	-30.26	+16.32	-16.76	+7.46	+21.78	+23.45	-32.43
	Collection	-75.4	-53.5	-65.43	-20.79	-18.72	+13.74	-19.67	+9.76	+21.52	+23.57	-29.63

TABLE IV

Name of District	Ascending order according to average rainfall	Percentage of irrigated area to area sown	Density of population per sq. mile
Sheopur	18.5	3.7	61
Morena	20.2	4.1	215
Sardarpur	23.2	1.8	135
Bhind	24.2	4.2	276
Shivpuri	24.2	12.3	117
Mandsaur	24.6	9.7	177
Gird	27.1	24.5	263
Guna	33.1	2.3	104
Ujjain	49.2	1.1	169
Shajapur	42.2	3.6	155
Bhilsa	54.4	0.1	133

When more than half the number of districts in Gwalior are under the shadow of agricultural insecurity which in drought years might shatter the standard of living and health of 19 lakhs out of 40 lakhs of the total population of the State, special priorities should be given to protective measures of agriculture and irrigation in these districts. It is the essence of planning that the tempo of progress is scheduled to be quicker in sick or backward districts than in the average district and this applies to developmental activities not merely in the fields of agriculture and irrigation but also in those of nutrition, sanitation, education and road development as well. Soil, rainfall and water-table are responsible for the precariousness of agriculture in districts like Bhind, Morena and Gird. The virgin jungle, unreclaimed marsh and the predominantly backward tribes of districts like Sardarpur, where the Bhils and Bhilalas represent about 60 per cent of the total population, are similarly responsible for primitive conditions. The improvement of agriculture, water-supply, sanitation and spread of education call for special measures and programmes here. In fact rural planning will be judged largely by the test whether it can bring up these districts quickly to the level of the more progressive districts.

TABLE V¹
Sources of Irrigation for Six Backward Districts
(Figures in Bighas)

Name of District	Irrigated Area					Net area sown	Percentage of irrigated to net area sown
	Canals	Tanks	Wells	Other sources	Total		
Bhind	17,586	1,592	14,500	719	34,393	10,05,162	3.4
Morena	5,812	3,974	26,093	1,321	37,200	9,06,382	4.1
Gird	1,37,053	12,636	17,027	1,888	1,68,604	6,86,590	24.6
Sheopur	4,672	14	6,271	205	11,162	3,79,425	2.9
Sardarpur	7	276	6,566	734	7,583	3,68,474	2.
Bhilai	..	100	1,558	138	1,796	9,71,800	0.2

1. See p. 11 *ante*.

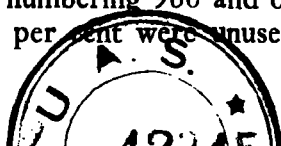
CHAPTER III

IRRIGATION

Agricultural conditions in Malwa represent a marked contrast with those in Gwalior Prant. Malwa comprises a plateau 1,600 feet above sea-level with a temperate climate and a soil which is one of the most fertile in India capable of yielding two crops. Wheat and cotton are very extensively grown, and both the standard of farming and that of living are on the whole superior to those of the rest of Gwalior.

In Gwalior Prant, wheat, cotton, sugar-cane, barley and gram are grown by irrigation. But cotton has disappeared and wheat has diminished in certain tracts of the north on account of the loss of humus due to run-off of water, the fall of the sub-soil water-level and the disuse of wells. In Malwa, poppy, sugar-cane and garden crops are cultivated with the help of irrigation. But poppy has greatly diminished in area leading to the neglect of irrigation in some areas. The rainfall is, on the whole, greater in Malwa than in the rest of Gwalior and accordingly there is less dependence upon irrigation. But there is no doubt that with greater irrigation in Malwa, wheat, cotton and sugar-cane will improve both in area and output. It is also necessary that Malwa should adopt the irrigation practice of Northern Gwalior by substituting the Persian wheel for the *charas* or leather-bag lift in well irrigation.

On the whole there are 446 miles of canals, about 1,000 tanks and 59,000 village wells for irrigation in the State. All wells are not utilized for irrigation, particularly in Gwalior Prant. The Director of Agriculture recently undertook a sample survey of all the villages. Out of the 72 chosen by random sampling 50 villages only had irrigation wells in all numbering 966 and of these as many as 181 wells or 18.7 per cent were unused. Out of 888



wells in 19 villages covered by Mr H. M. Bull's survey, 205, or 23 per cent are not being used for irrigation, as shown in TABLE VI.

TABLE VI
Use and Disuse of Irrigation Wells

Name of the village	District	Total No. of Irrigation Wells	No. of Wells unused
Santanwara Kalan	Shivpuri	11	8
Lukvasa	Shivpuri (Kolaras)	9	9
Mangrol	Morena (Sabalgarh)	75	18
Bilgoan (Chowdhary)	Morena (Jaura)	72	13
Nurabad	Morena (Jaura)	50	12
Pandola	Sheopur	20	9
Garhi	Sheopur (Bijeypore)	75	9
Antri	Gird (Pichhore)	136	89
Penchi	Guna (Chachaura)	50	7
Ramsar	Guna (Pachhar)	1	..
Daulatpur	Ujjain (Sonkatch)	17	..
Ingoria	Ujjain (Barnagar)	10	..
Masoodpore	Bhilsa (Basoda)	6	3
Sawan	Mandsaur (Neemuch)	70	15
Ratangarh	Mandsaur (Jawad)	76	..
Dhondarka	Mandsaur (Jawad)	82	..
Kanad	Shajapur (Agar)	58	..
Salyakheri	Shajapur (Susner)	55	..
Magrola	Shajapur (Susner)	15	..
	Total	888	205

The scope and practice of irrigation have to be extended considerably in the State for insuring against the caprices of rainfall. TABLE VII opposite shows not only the woeful inadequacy of irrigation but also its slow development during the last three decades.

For the purpose of improvement of the area under well irrigation the P. W. Department should make a systematic survey of the facilities and difficulties of well construction throughout Gwalior State. Many old pucca wells have fallen into disuse owing to the increase in their depth. Well construction has become too costly and uneconomic for the ordinary cultivators who should be given liberal

IRRIGATION MAP OF GWALIOR

SCALE: 1"=7.5 MILES

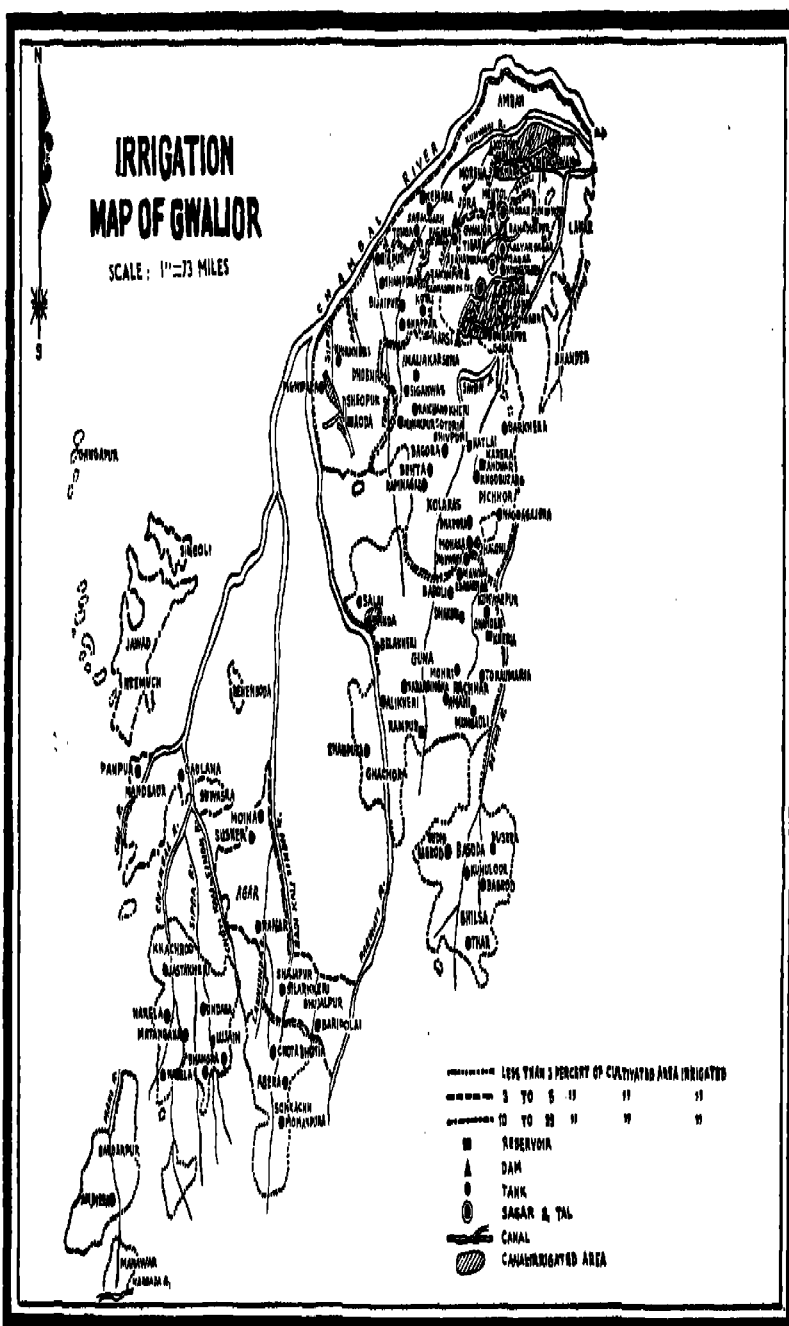


DIAGRAM II

PREPARED BY
SHYAM NARAYAN DRAFTSMAN

GEOLOGICAL & SUBSOIL

WATER TABLE.

SCALE: 1"=73 MILES

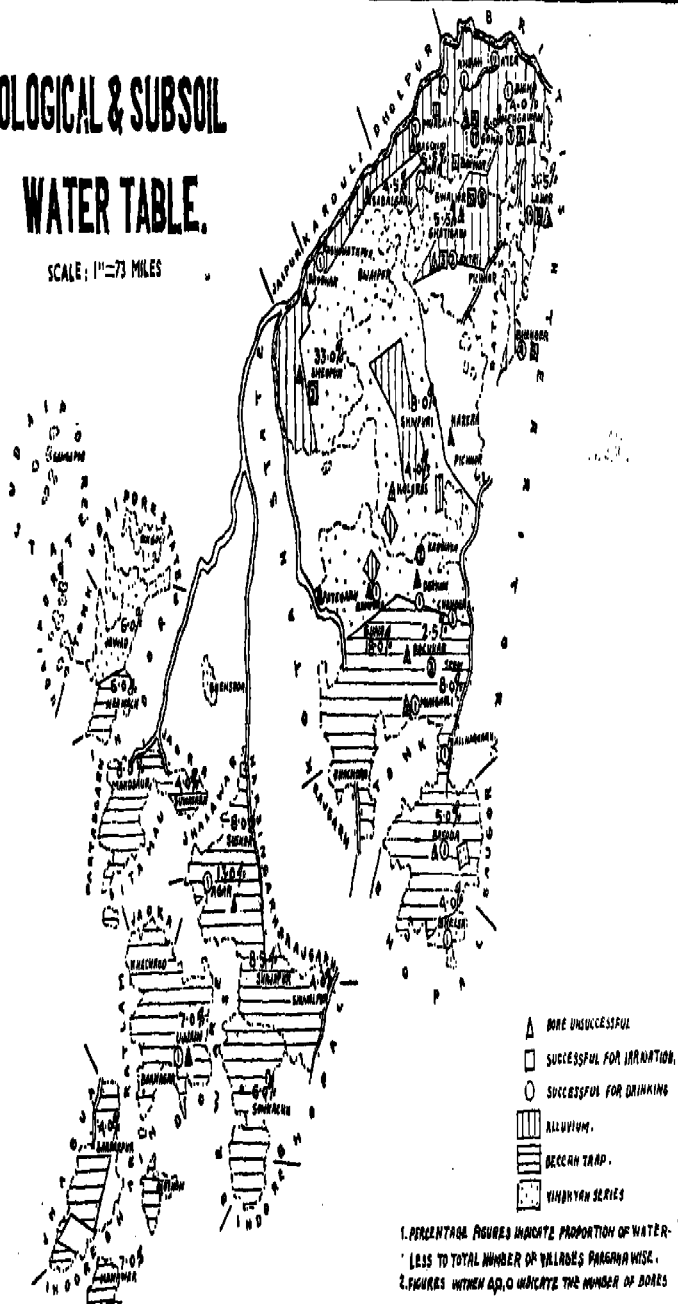


TABLE VII
*Comparison of Cultivation and Irrigation between
 Gwalior and Malwa Prants 1910-15 and 1934-39*

Prant	Net cropped area	Irrigated area	Percentage of irrigated to net cropped area
1910-15			
Gwalior Prant	51,33,882	1,98,547	3.82
Malwa Prant	27,64,518	1,16,362	4.18
1934-9			
Gwalior Prant	55,76,029	3,50,797	6.8
Malwa Prant	30,39,926	1,40,427	3.74

taqavi advances and also concessions in rent for the construction of new wells.

In many tracts in Northern Gwalior the repairs of existing pucca wells or the construction of new ones cannot be undertaken by the cultivator even with the grant of taqavi advances. The P. W. Department should itself undertake repair and construction of such wells, the expenditure of the State under this head being considered as an insurance against periodic droughts and serious reduction of land revenue.

It is necessary to set apart a special fund for well repair and construction in addition to the usual allotments for taqavi purposes. Tube-well surveys should be conducted in the State by an expert staff and if any hydro-electric schemes materialize the grid system should be utilized for the establishment of a system of electric-pumped State tube-wells and for power pumping from open wells, minor streams and tanks, especially in the districts of Sheopur, Morena, Bhind, Gird and Guna.

In addition to well irrigation, all possible projects for tank and canal irrigation have also to be examined. Tanks are the most common sources of irrigation in Gwalior Prant. Many old famine relief projects of tank irrigation and renovation of old tanks could be now translated into practice ensuring agricultural security.

Finally, there are several canal irrigation schemes that would further protect agriculture against deficient and ill-distributed rainfall. Expenditure for these schemes may be regarded as protective as well as revenue-yielding. These schemes (No. 106 in the Draft Plan) are listed below :

<i>Scheme</i>	<i>Description</i>
Restoration and improvement in the distributory system of Harsi and Bhind canals from their present deteriorated condition	
Paniar Stop Dam supplementing Aoda Dam, District Sheopur	An earthen dam supplementing the storage of the Aoda Dam. Site 7 miles up-stream from the Aoda Reservoir in Sheopur District. This will also supply drinking water and check emigration from Sheopur District.
Dokar-ka-tank, District Sheopur	This earthen dam is proposed to irrigate part of an arid tract in Sheopur Dt.
Ramana Reservoir, District Gird	This reservoir is expected to irrigate cultivated land commanded by the Morar pickup-weir.
Chentikhhera Kuari Project, District Sheopur	A composite dam for supplementing irrigation of land under Pagara Reservoir at Chentikhhera on the Kuari river.

Sindh River Scheme supplementing Harsi Dam, District Shivpuri

A masonry dam (gravity type) is proposed to hold approximately 3 to 4 thousand crore cubic feet of water. This will be situated near Nanakpur for irrigation and generation of power. The canal taking off from a proposed pickup-weir near Surna village will join the Mastura Canal for supplementing Harsi and Koketo Reservoirs. A road along the top of the weir will be provided connecting major and minor district roads. This will give a return of 2.5 to 3 per cent on the capital outlay for irrigation only.

Besides, there are many tank irrigation schemes that were started in years of famine, but left incomplete with the return of normal conditions. Many of these command appreciable irrigable areas and should be taken up at once for completion. Finally, the State should at once undertake a well-boring survey preliminary to the construction of masonry and tube-wells, district by district, in suitable localities. Scheme No. 107 for the development of tube-well irrigation should be suitably enlarged in its scope. It is only a comprehensive plan of irrigation development of various types suited to the local conditions in different regions that can assure the much-needed stability to agriculture and lead to its development along scientific lines under the peculiar conditions of soil, climate and rainfall in Gwalior.

CHAPTER IV

COLONIZATION AND SETTLEMENT

The State of Gwalior has a very considerable area of cultivable waste land which is waiting for the plough.

TABLE VIII
Cultivated and Waste Land, Gwalior State
(in bighas)

Description	Area	Percentage to total area
Cultivated area	91,61,409	36·9
Fallow land	32,12,969	16·0
Cultivable waste land other than fallow	29,12,323	11·8
Forests	34,86,810	14·6
Total area	2,47,94,184	79·3

The following table gives the proportion of cultivated land and of cultivable waste land to the total area in the various districts:

TABLE IX

District	Percentage of cultivated area	Percentage of cultivable land waste & fallow	Percentage of forests
Gird	29·77	24·12	17·56
Bhind	56·24	9·64	5·3
Morena	42·07	11·09	9·05
Sheopur	14·42	19·19	48·69
Shivpuri	25·37	35·05	21·34
Guna	31·13	34·06	12·3
Bhilsa	50·3	27·77	8·4
Ujjain	54·64	22·53	4·05
Shajapur	45·0	29·57	..
Mandsaur	39·25	22·9	4·67
Sardarpur	42·29	14·33	13·07

Present Mode of
COLONISATION



25000 Bighas Per year in Small farms

Before any scheme is launched to bring the cultivable wastes under cultivation, a preliminary land utilization survey should be undertaken for classifying the different kinds of waste lands and the reasons why these have been lying uncultivated. Lack of irrigation facilities and drainage, infestation with deep-rooted weeds, absence of means of communications, prevalence of yerrin, and danger from wild beasts are the factors that have to be dealt with in different tracts in any co-ordinated plan of utilization of waste lands in the State.

For more than two decades since 1923 attempts have been made towards colonization and settlement. In 1923 a colonization scheme was set up and, between 1923 and 1924, blocks covering in all 9,66,349 bighas were made available for colonization and transferred from the Revenue to the Colonization Department. In 1942-3 the total area under the colonization scheme was 5,82,369 bighas. This implies that 3,83,980 bighas have been re-transferred to the Revenue Department as settled area or as unculturable waste. Out of the 5,82,369 bighas covered by the scheme 97,903 bighas represent uncultivable waste and about 1,61,489 pasture land. Only about 1,50,000 bighas on an average have been under cultivation in recent years. In other words the remainder, about 1,72,970 bighas, would represent the amount of land in the colonization scheme which has not come under the plough. TABLE X shows the distribution of unoccupied chaks and blocks.

The main obstacles to colonization are : (i) the infertility of the land, (ii) inhospitality of the old settlers towards the new colonists, (iii) difficulties of water supply, (iv) depredations by wild animals, and (v) lack of agricultural capital with the new colonists for the purchase of cattle and implements and for construction of wells.

The following measures are likely to promote the cultivation of unoccupied land by new settlers :

- (1) Reclamation of virgin and weed-infested lands by means of tractors, construction of tanks and reservoirs and wells by means of taqavi advances for the supply of water for drinking and irrigation.



DIAGRAM IV

PREPARED BY
SHYAM NARAYEN DRAFTSMAN

TABLE X
Statement showing undistributed Chaks & Blocks

Undistributed chaks						Undistributed blocks						
District	Total No. of Chaks	Area under cultivation	Culturable area	Unculturable area	Total area	Total No. of Blocks	Area under cultivation	Culturable area	Unculturable area	Total area	Total No. of chaks & blocks	Total area under chaks and blocks
Gird	4½	95	4,559	1,108	5,762	11	..	1,361	198	1,559	..	..
Bhind	..	..	..	..	..	1	12	104	5	121	..	..
Morena	..	..	..	..	..	..	..	..	..	..	..	..
Sheopur	42	759	30,278	3,756	34,793	38	88	3,965	471	4,324	..	..
Shivpuri	29	1,244	21,885	5,088	28,217	36	792	8,613	902	10,307	..	..
Guna	18	1,859	11,061	6,696	19,616	43	859	3,767	604	5,230	..	..
Bhilsa	2½	515	722	267	1,504	36	672	3,073	94	3,839	..	..
Shajapur	..	..	..	..	..	54	540	4,667	1,043	6,250	..	..
Ujjain	..	..	..	..	..	3	30	294	56	380	..	..
Mandsaur	3	198	855	92	1,145	49	551	5,203	2,821	8,575	..	..
Total	6⅞	4,670	69,360	17,007	91,037	271	3,544	31,047	6,194	40,785	369 ⅝	23,201

(2) Road development to enable growers of cane, cotton, groundnuts, etc. to market these crops more easily.

(3) The supply of timber and stone for house construction.

(4) Protection against wild beasts especially in chaks and blocks near the forests.

(5) Taqavi advances to new settlers for the purchase of cattle, implements and seeds.

(6) Selection of energetic and enterprising colonists.

(7) Establishment of schools and dispensaries.

(8) Conferment of hereditary rights on holdings and discouraging the importation of hired labour. The size of the holdings should not exceed 50 bighas of cultivable land and such holdings should be indivisible and inalienable.

(9) Exemption of revenue for the first two years of settlement and charging 5 as. per bigha in the third year, 7 as. in the fourth year, 14 as. in the fifth year and normal revenue of Re. 1-4 in the sixth year of the settlement. The revenue should be realized only from the cultivated area and not from the banjar.

(10) Experiments in tractor farming on a collective basis should be made in big chaks and blocks measuring over 800 bighas in compact areas.

(11) Inner colonization : The demobilized soldiers and landless workers from the same district or from other districts within the Gwalior State should be encouraged to settle in the unoccupied chaks and blocks.

Even the interesting Rampura Colony, Guna District, which we visited and which received much assistance from the State, has neither a post office nor a dispensary, while the well available for the supply of drinking water is situated at a distance of about 3 miles from the settlement. The colonists also complained of the destruction of cattle and crops by wild beasts. Of the 30 families established in 1928 only 5 families left the Colony and were replaced. As many as 8 families have now been socially acclimatized and have not revisited Kolhapur or Berar at all. It may be estimated that only half the number of marriages can

now be settled locally ; for the other half the families have to seek connexions with their parent or other outside villages. This is a source of considerable expenditure and inconvenience. It is remarkable that improved seeds are used for all crops grown in the Colony, while there is also an instance of what is known as consolidation of cropping, rice and sugar-cane being grown in a compact area of about 50 bighas by all the cultivating families. There is, however, no agricultural co-operation discernible. On the whole the Colony exhibits a standard of farming and economic prosperity much higher than the average in Gwalior, and it is unfortunate that the irrigation from the Rampura Reservoir (which has a total irrigation capacity of 29,000 bighas) is no longer available because of a breach in the dam. The success of colonization and agricultural enterprise in Rampura is amply shown by the fact that while each settler had at the beginning only 3 bighas of cultivated area, with the remainder of 100 bighas as unreclaimed waste, each colonist owns now, on an average, 70 bighas of cultivated area—the result of unremitting toil on the virgin land during the last seventeen years.

The target for reclamation and colonization of virgin land in Gwalior should be 50,000 bighas per annum. For this purpose the Colonization Department must be strengthened by recruiting experienced engineering and agricultural staff. Adequate equipment and machinery such as bull-dozer tractors, power pumps and other machinery for jungle clearance, terracing, irrigation, drainage and large-scale mechanized collective farming should be made available. A special Land Development Officer and Forest Engineer should be appointed and specialized machinery bought to push through the reclamation and subsequent colonization programme as envisaged in Scheme No. 38. The resettlement of the fighting forces on the virgin lands of Gwalior will be rendered easier if certain aids and facilities such as adequate provision for agricultural capital, education, sanitation and other amenities envisaged in Scheme No. 1 are offered. This should at once be implemented with suitable modifications as indicated in



TARGET OF COLONISATION



50,000 BIGHAS IN LARGE MECHANISED FARMS

the previous paragraphs. Agricultural training might also be provided free of cost for soldier-settlers at each colonization centre to which should be attached a seed store where seeds of all kinds, manures and agricultural implements will be sold at concessional rates. Tractors and irrigation pumps will also be stocked there for lending at cheap rates.

There is great scope for pilot projects and experiments in different types of farm economy on the virgin land. The demobilized soldiers might be settled on non-transferable, individual family holdings of 50 bighas each that may not be sub-divided nor sub-let. Such peasant farming might be substantially improved by co-operative ownership and use of agricultural machinery, consolidating of cropping, co-operative purchase and sale ; or such peasant holdings might be consolidated into a co-operative farm serving as a single unit for joint cultivation and management without disturbing the rights of individual ownership. There is scope for establishing large collective farms of 800 bighas or more for mechanized agriculture. Discharged soldiers that belonged to the mechanized fighting units could be usefully employed on such collective farms. Valuable experience will thus be gained in respect of the social and economic effects of new types of farming organization in the State.

CHAPTER V

CROP-PLANNING

Any sound agricultural planning must include crop-planning, whose objectives are : (i) to secure an optimum distribution of area between food and non-food crops, (ii) to improve the nutritional standard of the cultivators through the production of more nutritive and heavier yielding crops, (iii) to raise the utilization of human and cattle power in the fields to the maximum. Particularly in a region like Gwalior where crop rotation has been revolutionized through the sudden diminution of poppy and cotton in certain tracts and by the difficulties of irrigation everywhere, a judicious selection of crops and crop rotation should be regarded as essential in agricultural policy.

It is note-worthy that in the last two decades there has been a steady diminution of the acreage under wheat and barley in the Gwalior State, as shown in the following table :

TABLE XI A
Trend of Wheat cultivation in Gwalior State
(in Bighas)

	1914-19	1924-9	1934-9	1943-4
Gwalior Prant	13,67,200	14,06,498	17,09,853	12,54,584
Malwa Prant	5,89,686	6,22,691	7,23,788	8,29,798
Gwalior State	19,56,886	22,29,192	24,13,641	20,84,483

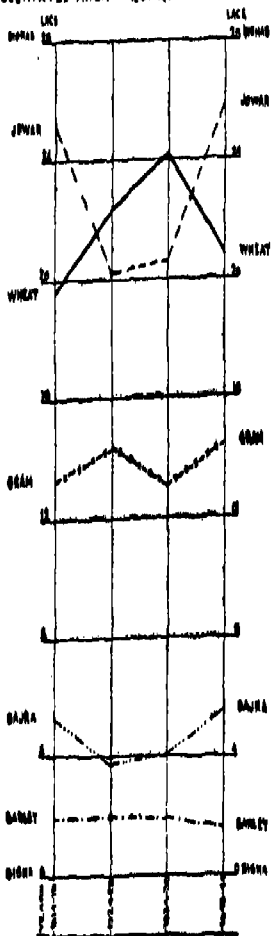
TABLE XI B
Trend of Barley cultivation in Gwalior State
(in Bighas)

	1914-19	1924-9	1934-9	1943-4
Gwalior Prant	1,68,200	1,77,073	1,71,756	1,44,598
Malwa Prant	16,000	21,530	11,803	14,796
Gwalior State	1,84,200	1,90,605	1,83,559	1,59,551

In Gwalior Prant wheat cultivation has decreased by 4½ lakh bighas during the last decade. It is the large

TRENDS OF MAJOR CROPS IN GWALIOR

CULTIVATED AREA - QUINQUENNIAL AVERAGES



TREND OF WHEAT CULTIVATION IN NORTHERN GWALIOR

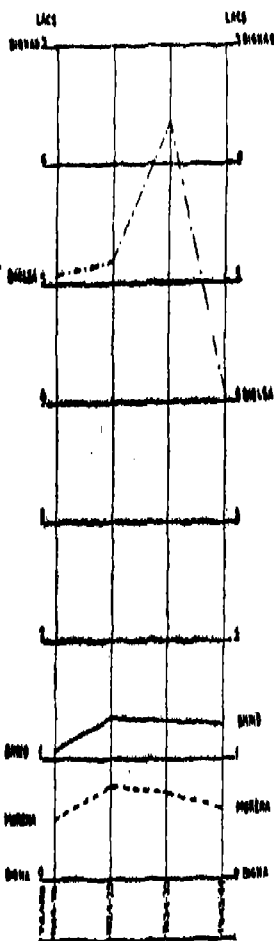


DIAGRAM V

PREPARED BY
SHYAM NARAYAN DRAFTSMAN

LOCALISATION OF WHEAT AND GRAM



reduction of the wheat area in Bhilsa District in particular that is responsible for the reduction of the aggregate acreage of wheat crop in this Prant. Practically, all districts in this Prant show decrease in wheat cultivation.

With respect to crop-planning it is not easy to indicate the features of a progressive policy, in the absence of reliable data with regard to crop yields. Since the agricultural situation of Bhilsa in Gwalior Prant is rather peculiar, it will be worth while to indicate the features of a more progressive agricultural adjustment in this particular district.

TABLE XII
Trend of Wheat, Jowar and Gram in Bhilsa
(In Bighas)

Crops	1914-19	1924-9	1934-9	1943-4
Wheat	5,07,360	5,19,746	6,33,278	4,03,209
Jowar	63,600	96,641	85,873	2,24,113
Gram	1,17,700	1,26,425	1,35,273	20,84,483

The kharif area is extremely small in Bhilsa, the proportion of kharif area to net cropped area being 17.2 per cent as compared with about 55 per cent in Guna and 83 per cent in Shajapur, another neighbouring district. Two village surveys, undertaken by Mr H. M. Bull in Guna, amply indicate the crop position. In one village the total area cultivated in kharif, chiefly jowar, arhar and chari is 349 bighas, while the rabi area, chiefly wheat, gram and alsu is 3,256 bighas. In another village the kharif area represented by jowar, maize and chari is 102 bighas as compared with the rabi area of 1,102 bighas, the major rabi crops being wheat, gram and oil-seeds. Hardly any irrigation is done in both the villages. The cultivators depend on the rains alone. Wheat and gram are the dominant crops of Bhilsa District. On the other hand, in spite of the dependence on one crop, namely wheat, the district has shown a diminution of this crop from the average of 5,54,339 acres for the five years 1934-5 to 1938-9 to only 2,08,269 acres in 1943-4. Even in the kharif crop, jowar

which is the most important in Bhilsa shows a diminution from 1,40,625 acres in 1929-30 to 1,15,761 acres in 1943-4.

Jowar cannot stand high rainfall. The main cause of diminution of area under jowar in Bhilsa is high rainfall accompanied by the bad distribution of rain. Neither rice nor maize is grown to any appreciable extent. Rice area is 3,552 acres ; maize, which in the U.P. and particularly in Bihar is grown under heavy and incessant rainfall, occupies only 6,289 acres in Bhilsa. Laboratory experiments in rice, maize and jowar may give us the suitable varieties that may be tried with a view to the improvement of kharif area and yields. Their cultivation is important from another point of view. It is jowar, rice and maize that supply the stalks used as cattle fodder, the lack of which has led to the marked deterioration of cattle in that district.

Even for the rabi cropping the wheat area has been reduced, as we have seen, to about a half in about 15 years. Irrigation from the low-lying rivers such as the Betwa and other minor streams as well as from tanks would certainly improve the wheat acreage. For several years in the past rains have failed in Bhilsa in the latter part of the season, affecting particularly wheat and gram. The construction of dams on the minor streams or lift irrigation would prevent that shrinkage of rabi cultivation.

In certain tracts controlled flood irrigation might greatly aid rice cultivation.

There is no gainsaying the fact that such dependence of the whole district upon one crop, namely wheat, which again shows steady diminution of area during the recent years, makes the district precarious and susceptible to slight fluctuations of both the amount and distribution of rainfall. The expansion of wheat that had been relatively recent in this natural zone of millets is now showing a serious set-back due to the inadequacy of irrigation. On the other hand the large size of the average holding, usually 40 to 50 bighas, is a great handicap to intensive or even sufficient tilling of the soil and the proper preservation of moisture by well-irrigation, which might have maintained

both the area and efficiency of wheat farming. Mixed farming of wheat on the basis of stall feeding cannot develop if holdings are too large and at the same time the cultivator is insolvent.

In the whole district there are about 17,000 she-buffaloes today, and 76,000 cows. This huge multitude of cattle is, however, mostly of poor quality and uneconomic. It is note-worthy that she-buffaloes increased from 2,470 in 1930 to about 16,000 in 1941, the peasantry finding buffalo-keeping as remunerative as in the Meerut Division for instance, where, however, mixed farming is carried on in association with much more intensive agriculture than in Bhilsa.

The following are the essential steps towards the agricultural recovery of Bhilsa :

- (1) Survey of the sources of irrigation and of the areas that may be commanded by irrigation from tanks and reservoirs or by flood irrigation.

- (2) Introduction of adaptive varieties of rice, jowar and maize in the kharif season.

- (3) Introduction of dry farming system of cultivation for wheat, gram, oil-seeds and other rabi crops.

- (4) Introduction of dairy farming along with wheat cultivation with the use of fodder from 'bhusa' and jowar stalks stored as a reserve.

- (5) Drainage of water-logged areas.

- (6) Introduction of tobacco, castor seeds, potatoes, chillies and other vegetables into the crop-planning adjusted appropriately for both irrigated and unirrigated conditions.

We have examined the case of Bhilsa first because it is one of the most vulnerable among the districts in Gwalior State, suffering recurrently from agricultural vicissitudes and also because of its steady diminution of the wheat area which is the largest yet in Gwalior and also of jowar area in kharif season, all indicating a striking increase of insecurity.

But there are other districts like Bhind, Morena and

Sheopur indicating progressive agricultural deterioration. All the three districts show also a striking reduction of the wheat, and as a whole, of rabi acreage.

TABLE XIII
Trends of cultivation in Northern Gwalior
(in bighas)

Districts	Wheat			
	1914-19	1924-9	1934-9	1943-4
Bhind	1,07,080	1,35,339	1,32,904	1,30,400
Morena	49,400	78,423	73,322	59,220
Sheopur	70,900	78,135	1,18,200	83,505
Districts	Barley			
	1914-19	1924-9	1934-9	1943-4
Bhind	65,280	1,90,580	1,83,559	1,64,451
Morena	38,000	54,798	45,169	20,517
Sheopur	6,440	6,049	6,000	4,241
Districts	Gram			
	1914-19	1924-9	1934-9	1943-4
Bhind	3,07,040	3,47,785	3,04,114	3,24,221
Morena	2,90,600	3,19,984	3,40,560	2,56,077
Sheopur	31,260	42,519	32,853	42,945
Districts	Jowar			
	1914-19	1924-9	1934-9	1943-4
Bhind	1,40,520	1,23,000	1,14,605	1,22,224
Morena	1,75,700	1,33,000	1,14,938	1,62,181
Sheopur	1,24,460	92,200	91,141	1,28,641
Districts	Bajra			
	1914-19	1924-9	1934-9	1943-4
Bhind		1,21,395	1,12,667	1,46,906
Morena		1,76,829	2,09,688	2,64,372
Sheopur		29,223	31,199	53,165

The general trend in Northern Gwalior is towards diminution of all rabi crops—wheat, gram, and barley, and towards increase of the kharif crops, viz. jowar and bajra.

LOCALISATION OF JOWAR AND BAJRA

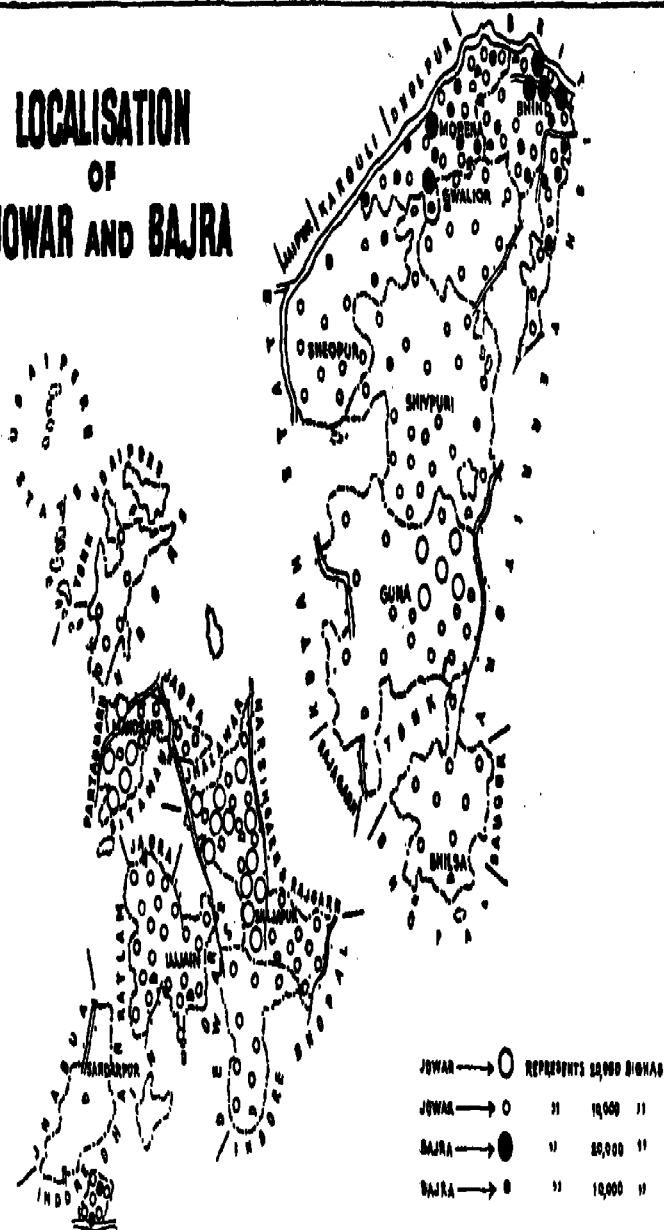
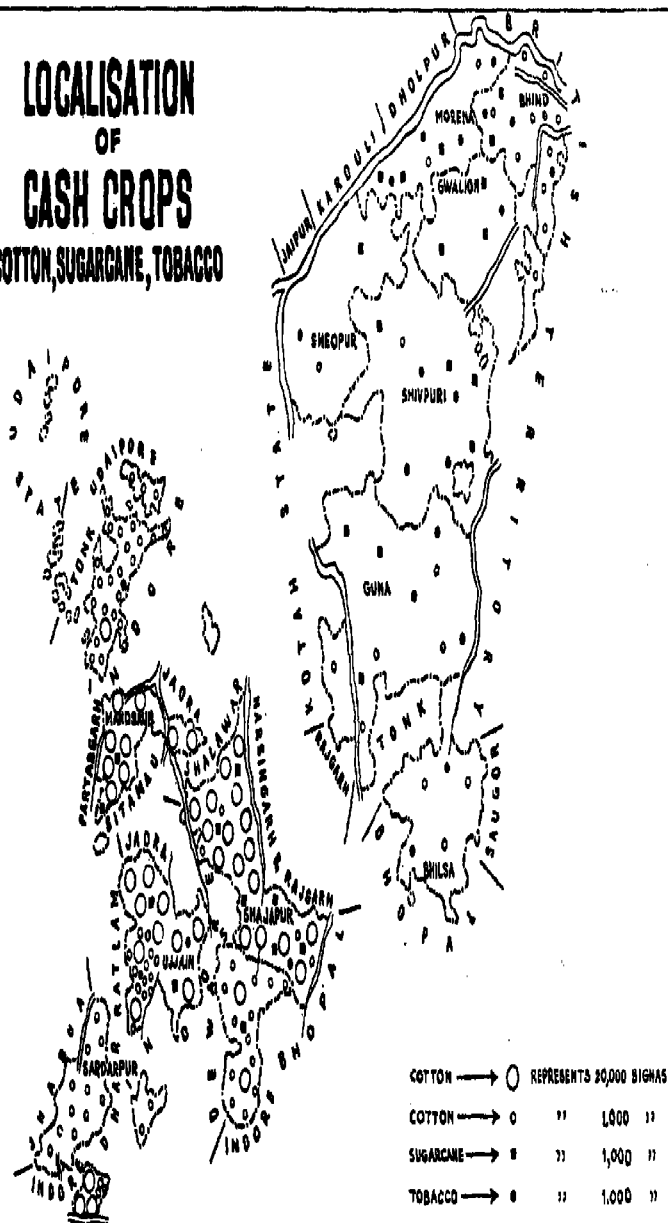


DIAGRAM VII

PREPARED BY
SHYAM NARAYEN DRAFTSMAN

LOCALISATION OF CASH CROPS

COTTON, SUGARCANE, TOBACCO



In Malwa on the other hand, there are discernible the healthy tendencies of a general increase of wheat cultivation, and decrease of gram and barley. The wheat and barley trends are already given in TABLE XI. The trends towards increase of jowar, gram and bajra cultivation are given below. The figures are in reference to Khalsa areas alone.

TABLE XIV

Trends of cultivation in Gwalior Khalsa area

(in bighas)

Jowar				
	1914-19	1924-9	1934-9	1943-4
Gwalior Prant	13,70,400	10,69,800	10,71,857	14,21,012
Malwa Prant	11,38,200	9,48,600	9,12,342	11,64,667
Gwalior State	25,08,600	20,18,400	20,64,199	25,85,679
Gram				
Gwalior Prant	11,36,400	12,29,800	11,32,200	12,49,461
Malwa Prant	1,86,600	2,05,600	1,75,000	2,01,008
Gwalior State	13,23,000	14,35,400	13,07,200	14,50,469
Bajra				
Gwalior Prant	4,97,000	3,47,200	3,75,000	4,91,359
Malwa Prant	30,200	23,200	29,000	54,915
Gwalior State	5,27,200	3,70,400	4,03,000	5,56,274

The diminution of the rabi area in Northern Gwalior is largely due to the gullies on the banks of the river Chambal and its tributaries eating into the fertility of wheat lands and also due to the irrigation getting increasingly difficult on account of the fall in the water level.

Even in a district like Guna, where the percentage of gross cultivated areas under wheat (31) is the largest in Gwalior Prant there has been a steady decrease of wheat cultivation and increase of jowar and gram. The following table bears testimony to this :

TABLE XV

Areas under different crops in Guna
(in acres)

	1924-5	1943-4
Wheat	1,57,792	1,20,007
Jowar	1,23,665	2,03,704
Gram	60,605	84,122
Linseed	7,921	10,758
Net area sown	4,25,212	5,12,114

Wheat statistics in Gwalior usually include mixed wheat crops. A further analysis of the acreage under wheat in Guna between 1936 and 1943 shows that the pure or unmixed wheat area has decreased by about 1,36,000 bighas or about 40 per cent. On the other hand the area under pure gram in the same period has increased from 78,000 bighas to 1,86,000 bighas or by about 140 per cent.

TABLE XVI

Trend of Wheat cultivation in Guna
(in bighas)

Year	Wheat		Mixed Wheat & Gram		Mixed Wheat & Barley		Mixed Wheat & Sesamum	
	A	B	A	B	A	B	A	B
1936-7	7,230	3,21,509	325	17,635	306	97	96	33,316
1943-4	5,334	1,85,925	657	45,294	1,050	603	42	31,916
+ or -	-1,896	-1,35,584	+332	+27,639	+724	+506	-54	-1,400

A = Irrigated

B = Dry

The normal soil of Gwalior Prant yields one crop—either wheat or jowar—in the same year. Dofasli area is indeed very restricted due to lack of irrigation facilities. Thus on an average plot of land jowar is sown in the kharif season, and harvested about November, and the land is kept fallow in the rabi season. The following year

the land is sown with wheat and/or gram. Gram supersedes wheat in dry or unfertile tracts especially in the north where the water level is low and irrigation small. Where there are irrigation facilities maize will be grown in the kharif and the harvesting of the crop will take place in about September, enabling wheat also to be grown in the same year. In the district of Guna, as an economic survey of several villages has indicated, the well-irrigated land yields 10 to 12 maunds of wheat per bigha as compared with only 4 maunds per bigha where there is no irrigation. Other crops grown under irrigation are potato, coriander, methi and sugar-cane. The difficulties of well-irrigation have increased greatly in recent years even outside Bhind and Morena where the depth of the sub-soil water level and the incapacity of cattle for lifting water from the great depths have made well-irrigation almost impossible ; even in the district of Guna the high cost of well-construction, estimated at about Rs. 800 to 1,200, greatly restricts well-irrigation.

Few cultivators can command the amount of agricultural capital required, nor can they afford to keep additional cattle, the cost of maintenance of which has also considerably increased in recent years. Where irrigation facilities from tanks and wells are available farmers of some castes like the Karars and Ahirs show a good deal of enterprise and attain a high standard of farming, growing a variety of crops, viz. rice, jowar, maize, urd, moong, mattar, masur, wheat, methi, coriander and sugar-cane. The standard of cultivation here reaches that of the Meerut Division. Wherever well-irrigation affords such facilities, the vegetable growers like the Kachchhis produce potatoes, and all kinds of vegetables.

Everywhere an improvement in agricultural yield can be secured with the distribution, by the Agricultural Department, of improved varieties of seeds selected with reference to the soil, the water level and the distribution of rainfall in the area. Hardly any money or effort has been spent for this purpose. But the recent shining example in Guna, where the Central Co-operative Bank distributed

about 3,000 maunds of improved seeds, ought to serve as an eye-opener. In one particular village surveyed, about 8,00 bighas of land have come under improved seeds, leading to an improvement in yield of at least 25 per cent. The entire cane area is under C. O. 312 within five years of its introduction. This yields about 288 maunds of cane or 24 maunds of *gur* per bigha. An improved variety of rice selected from the local Guna seeds has also been popularized by the Agricultural Department. Though the yield remains the same as that of the indigenous variety, viz, $2\frac{1}{2}$ maunds per bigha, there has been a great improvement in the quality which ensures a ready market. Wheat, rice, sugar-cane, coriander and jowar cultivation in the village Dadhankheri visited is all done with the improved variety of seeds. Greater progress has been made in the introduction of improved seeds of wheat and jowar than that of sugar-cane and paddy for the district as a whole :

TABLE XVII

*Area added under improved varieties of crops in
Guna District 1943-4*

Crops	Areas in bighas	Estimated additional income for the cultivator per bigha	
		Rs.	As.
Wheat	9,111	20	0
Jowar	26,172	5	0
Gram	13,584	5	8
Sugar-cane	2,308	20	0
Rice	765	9	10
Miscellaneous	2,913	2	11
Total	54,855		

In the case of sugar-cane, ratooning is still in wide vogue, the ratoon crop in the second year yielding half to two-thirds of the crop yield of the first year. Cultivators who are poor seek to economize in the purchase of seeds and cost of tillage and grow the ratoon. The co-operative

movement should be extended wherever possible for the distribution of improved seeds suiting local conditions. A multiple purpose Society is especially suitable for distributing improved seeds and artificial fertilizers among the cultivators and also for undertaking the sale of the crops.

It is only agricultural research based on an intimate knowledge of the soils, crops and farming practices of the various agricultural tracts of Gwalior as determined by initial scientific soil survey that can make for an all-round agricultural progress. There are only four districts now in which we have agricultural experiment stations. More research stations or sub-stations will be required to devote their attention to the breeding and improvement of the principal food crops, oil-seeds and garden crops, region by region. Experimental work is required for the improvement of tillage methods and crop-rotations and the elimination of diseases as well as for the reclamation of severely eroded lands in Bhind and Morena and of alkaline lands in the Harsi irrigated zone. Schemes Nos. 39 and 40 in the Draft Plan submitted by the Agricultural Department for the establishment of district experimental farms and demonstration centres in villages deserve special priority. It is essential that each soil tract of Gwalior should have its own experimental farm for agricultural research and guidance. The location of each station has to be determined by a careful soil and crop investigation of the State. Similarly the Agricultural Department has in its project of multiplication and distribution of improved varieties of seeds (Schemes Nos. 41 and 42) proposed to cover an area of one lakh bighas with improved varieties of seeds in the course of five years. Improved seeds will be produced and multiplied in Government subsidized farms of registered growers and measures will be adopted to keep these varieties pure. Thus the seed stores and seed multiplication farms will form the nuclei of agricultural improvement and propaganda activities. Subsidized sales of improved seeds will be necessary in particular cases, as for instance in Bhind, Morena and Bhilsa, where wheat grow-

ing is now encountering serious difficulties and has to be specially encouraged by Government subsidy to the extent of 25 to 33 per cent on the supply of improved seeds and manures to the cultivators. Improved ploughs and other agricultural implements, suited to the various soil tracts of the State, should be popularized, and Scheme No. 35 which envisages the establishment of an Agricultural Engineering Section of the Agricultural Department should receive full consideration. The Agricultural Engineering staff should advise the cultivators on the use of improved ploughs, tractors, threshers, drills, harrows, etc. ; on terracing, counter-trenching, ridging and bunding ; or again, on strip cropping, sinking of wells and power pumping. Since many of these machines and implements are beyond the resources of the average cultivator the State should own such machinery both for demonstration and for hiring out to cultivators or their co-operatives at cheap rates.

The Department of Agriculture has at present no horticultural section, which should be started early in order to carry out research on the improvement of fruits and food products of the State and establish proper nurseries for supplying improved seeds and grafts to the cultivators. Lashkar, Shivpuri and Ujjain are the best suited centres for the establishment of such nurseries (Scheme No. 37) and fruit research stations. There is large scope for the improvement of the existing fruit gardens, and for bringing virgin lands under quick-growing fruits in Gwalior. For the full utilization of fruits, experiments will have also to be made into possibilities of fruit canning and of manufacturing fruit preserves, which have a large market in Gwalior and outside.

In crop-planning our target should be a proportionately much greater increase of such nutritive crops as wheat, pulses and potatoes rather than of cereals like barley, jowar, and bajra. Protective foods as represented by vegetables and fruits of many kinds require special attention and encouragement. The present tendencies show a marked diminution of wheat and a striking expansion of jowar and bajra in particular. Such tendencies will have to be

corrected by planned farm economy. In 20 years it is expected that all the major crops will be grown in their improved and adaptive varieties throughout the State ; in the meanwhile agricultural experiments should mark out the varieties which not only give a heavier yield, but are also more suited for resistance to drought, disease, etc. This would considerably increase the out-turn, crop by crop and bigha by bigha. The targets of production for each crop in the State are indicated in a later chapter. The Agricultural Department is under-staffed, and as now constituted it cannot discharge its responsibilities adequately. It needs to be reorganized and strengthened considerably on the lines proposed in Scheme No. 34. Additional facilities, staff and equipment should also be provided immediately for the various agricultural research stations (Scheme No. 36). Provision should immediately be made for systematic training of agricultural field-men in demonstration and propaganda work throughout the State. Training Schools could suitably be attached to selected Agricultural Department Farms in the State.

It is only the improvement of irrigation and introduction of drought resistant varieties of wheat that can avert the deterioration of nutrition standards ; while the cultivation of barley with gram can also be extended in non-irrigated areas or in the dry season. Maize may expand in many districts of Gwalior and pulses like urd and moong and especially guar, which is of great importance for the feeding of cattle, may enrich the kharif crop. Guar is an important pulse crop in the Punjab where it yields about 260 maunds of green fodder per acre, and about 66 maunds of seed when grown as pulse. In districts suffering from chronic fodder deficiency and in the intensive cattle-breeding areas, the cultivation not only of guar but also of other suitable fodder crops should be encouraged by subsidy or by free distribution of fodder crops and cuttings. Scheme No. 108 is important in this connexion from the point of view of both mixed farming and the improvement of dairy produce. Similarly certain industrial and cash crops require encouragement through some subsidy (taking the

form of seeds to the cultivator at half or two-thirds the price) that will vary from district to district according to agricultural conditions. Scheme No. 109 deserves early attention. The yield of sugar-cane per bigha is very much smaller in Gwalior than, for instance, in the U. P. and can be increased to twice the present out-turn, thereby improving both the economic position of the cultivator and the prospects of Gwalior's sugar industry. Similarly the development of cigarette tobacco will bring increased return to the cultivator. Sugar-cane, tobacco, hemp, cotton, soya-bean, groundnuts and castor seeds may prove valuable cash crops in different areas in Gwalior. The cultivation of vegetables and fruits of all kinds is also very much to be desired as an addition to protective foods. It is possible to increase the average yield very soon by the development of seed schemes and by the introduction of proper manuring and farm practices ; and this should also accompany planned crop-rotation in which leguminous crops should be popularized as contributing towards both soil-conservation and improvement of human and animal nutrition, through the supply of vegetable proteins for the vegetarian population and of seeds, hulls and green parts for the livestock.

CHAPTER VI

TARGETS FOR NUTRITION AND AGRICULTURE

In a system of planned economy the targets not only provide the objectives but their determination supplies the criteria for measuring progress as the Plan gets into operation, calling for such adjustments as may be found necessary in the development of the Plan. In fixing targets for agricultural production three main essential principles have been kept in view, viz. (i) Nutritional self-sufficiency, (ii) Maximizing the exports for the exchange of goods needed to raise the standard of living of the rural masses to a level of reasonable comfort, and (iii) Provision of agricultural raw materials in which the State enjoys the maximum advantage of comparative costs for an expansionist industrial economy.

According to the census of 1941 there were in Gwalior State 40,06,159 people equivalent to 33,35,323 in 'man value' for nutrition purposes as follows :

TABLE XVIII
Population of Gwalior State

Ages	Number	Man value per head	Total man value
O-15 years	15,93,713	0.7	11,15,599
Men 15 and upwards	12,78,791	1.0	12,78,791
Women 15 and upwards	11,33,655	0.83	9,40,933
Total	40,06,159	0.835	33,35,323

TABLE XIX overleaf shows the average production and supply of food articles during the pre-War period :

TABLE XIX

Production and supply of food articles in Gwalior State

(Average for the years 1934-9 : Figures in maunds)

Articles	Production	Imports	Exports	Net available
Wheat	1,10,67,479	4,38,140	17,68,266	97,37,353
Barley	10,53,576	16,964	14,406	10,56,134
Jowar	1,02,32,938	67,797	8,48,845	94,51,890
Bajra	16,75,480	1,005	3,09,076	13,67,409
Rice	10,27,082	45,403	78,860	9,93,625
Masoor	5,21,920	2,35,358	4,788	7,52,490
Gram	62,42,841	36,000	4,16,000	58,62,841
Total Cereals	3,18,21,310	8,40,667	34,40,241	2,92,21,742
Moong	Figures not given	4,250	1,41,940	
Urd	"	6,225	32,700	
Tuar	"	6,055	42,682	
Masoor	"	2,473	26,669	
Other Pulses	"	12,339	1,73,952	
Total pulses	21,99,870	31,342	4,17,943	18,13,269
Sesamum	8,40,403	17,282	50,046	8,17,639
Rape & Mustard	1,47,360	8,523	76,230	79,653
Groundnuts	1,47,377	32,773	34,603	1,43,544
Total Oil-seeds	11,35,140	58,578	1,60,879	10,40,836
Potatoes	1,20,000	62,000		1,82,000
Milk	1,73,10,000		9,62,155	1,63,50,000
Sugar	2,76,000 (Gur)	4,36,000 (Gur) 3,28,000 (Sugar)		10,41,000

Out of the net available supplies in Gwalior State, those utilized for human consumption have been estimated as below :

TABLE XX
Normal Supplies and Consumption
(Average for 1934-9 : Figures in lakhs of maunds)

Articles	Net available as per last table	Utilization	
		Other purposes (a)	Human consumption
1. Cereals	222.2	94.8 ¹	197.4
2. Pulses	18.1	2.2 ²	15.9
3. Oilseeds	10.4	2.2 ³	8.2
4. Vegetables ⁴	18.2	0.9	17.3
5. Milk	163.5	120.0 ⁵	43.5
6. Sugar	10.4	..	10.4

These supplies fall much below the standard requirements for human nutrition, and the deficiency as judged by calorie consumption is more than 24 per cent. In TABLE XXI overleaf the average consumption per adult on the basis of supplies estimated above is contrasted with the nutritional norms, in order to show the deficiency in a clearer perspective.

(a) *These have been arrived at as under :*

1. 50 per cent of gram production for cattle use. 20 per cent of the total produce for seed, loss in transit, cattle use, exports as flour, etc.
2. 10 per cent of the produce for seed and loss in preparation, etc.
3. 10 per cent of supplies for seed and losses in crushing and storage and another 10 per cent for the use of cattle and industrial requirements.
4. Total vegetables have been estimated by taking 10 times the potatoes grown.
5. This is utilized for the production of ghee and other milk products. The consumption of ghee amounts to 5.2 lakh maunds while the total of ghee and other milk products leaving separate (i.e. butter milk etc.) comes to an average of 0.8 oz. per adult per day.

TABLE XXI
Average consumption and requirements per adult per day

	Present Diet		Dietetic Norm			
	Quantity in ounces	Calories	Vegetarian Diet		Non-vegetarian Diet	
			Quantity in ounces	Calories	Quantity in ounces	Calories
Cereals	22	2,200	22	2,200	20	2,000
Pulses	1·7	170	3	300	3	300
Ghee & Oil	1·15	240	2	420	1½	315
Vegetables	?	10	4	90	6	135
Milk	4·7	83	8	164	4	82
Fruits	?	..	2	50	2	50
Sugar	1·1	125	2	228	2	228
Meat, fish & eggs	..	..	..	..	3	110
Total	30·65	2,828	43	3,452	41½	3,120
Deduct 10 per cent loss in kitchen		-283		-345		-312
Calories available		Net 2,545		3,107 C.		2,808 C.

The requirements of the State in various food articles in 1951, or say after 5 years of the adoption of a plan in 1946, calculated for an estimated population of 45·7 lakhs ('Man value' 38 lakhs) on the basis of a balanced diet, work out as under :

TABLE XXII
Food Requirements of Gwalior State for 1951

Articles	Standard Requirements per day per adult in ounces	Total Requirement in lakhs of maunds
1. Cereals	22·0	225·0
2. Pulses	3·0	31·4
3. Oil	1·12	46·0 ¹
4. Ghee etc.	0·8	8·4 ²
5. Vegetables	4·0	42·2
6. Milk (fluid)	8·0	101·5 ³
7. Fruits	2·0	21·1
8. Sugar	2·3	21·1
9. Meat, Fish, and eggs	3·0	..

DIET

PRESENT DIET

DIETETIC STANDARD

22 oz.



CEREALS

22 oz.

17 oz.



PULSES

3 oz.

1.15 oz.



OIL

GHEE

2 oz.



?



VEGETABLES

4 oz.

4.7 oz.



MILK

8 oz.



?



FRUITS

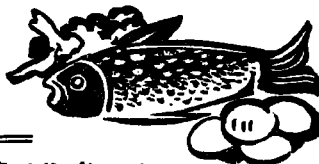
2 oz.

1.1 oz.



SUGAR

2 oz.



TOTAL 30.65 oz. MEAT, FISH & EGGS TOTAL 43 oz.

The cereal consumption of 22 oz per adult per diem is based on the assumption that the other items of consumption will be available in physiologically adequate quantities. Otherwise the cereal requirement will have to be pitched up to at least 25 to 32 oz according to the deficiency in other items of consumption. Even thus however, the diet will remain unbalanced.

Adding to these requirements those for exports and industrial and other needs, the totals which should be aimed at in a system of planned rural economy have been estimated as per TABLE XXIII opposite.

The targets laid down here envisage an overall increase of about 73 per cent in agricultural production, which at the current level of prices will imply an increase of more than 77 per cent in terms of money, i.e. from the present figure of Rs. 47·87 crores to Rs. 84·60 crores in 1951. The projected increase has to be brought about partly by increasing the average yield per acre through better soil management and improved farming, and partly by ploughing more virgin soils and rational land utilization.

The targets for the average yield per acre which can be reached without changing the basic structure of rural economy in the State are given in TABLE XXIV.

An improvement of agricultural production by 73 per cent in 20 years is by no means difficult. Money spent by the State on agricultural research and dissemination of improved seeds as well as the cultivator's own adoption of improved farm practice and manurial treatment can easily improve the yield of crops per bigha by 50 to 100 per cent. Vast virgin tracts ploughed scientifically by bull-dozer tractors can add a big percentage to the aggregate agricultural production of the State. There are large stretches of kans infested lands, now beyond the reach of ordinary ploughing, that can be tackled only by tractors. Canal and well irrigation so imperfectly developed in the State will

(Footnotes to Table XXII)

1. Oil-seeds.
2. Worked out on the assumption of 8.0 oz per person and not per adult.
3. Milk required works out at 133·0 lakh maunds.

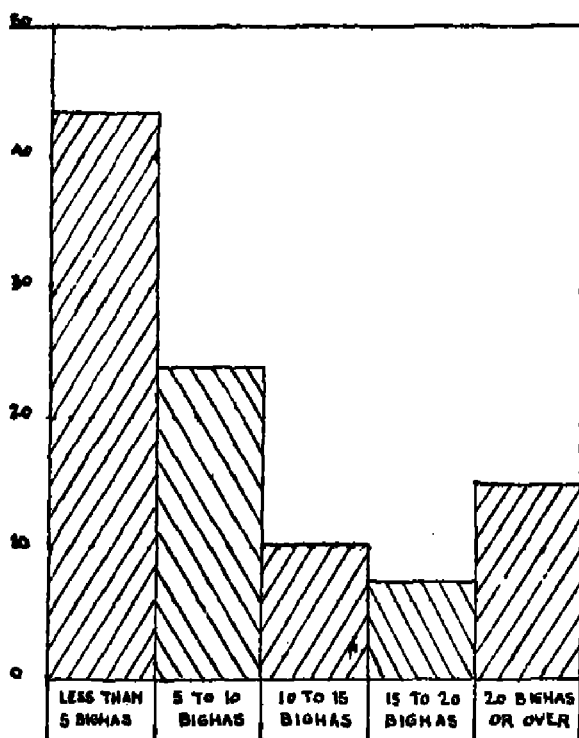
DISTRIBUTION OF TENURES

KHUB-KASHI 12.5	OCCUPANCY 40.5	NON-OCCUPANCY 30.5	OTHERS 14.5
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SMALLNESS OF HOLDINGS

PERCENTAGE DISTRIBUTION OF
CULTIVATORS CULTIVATING

PERCENTAGE



TARGETS OF AGRICULTURAL PRODUCTION

PERCENTAGE INCREASES ENVISAGED
IN THE PLAN OVER PRESENT PRODUCTION

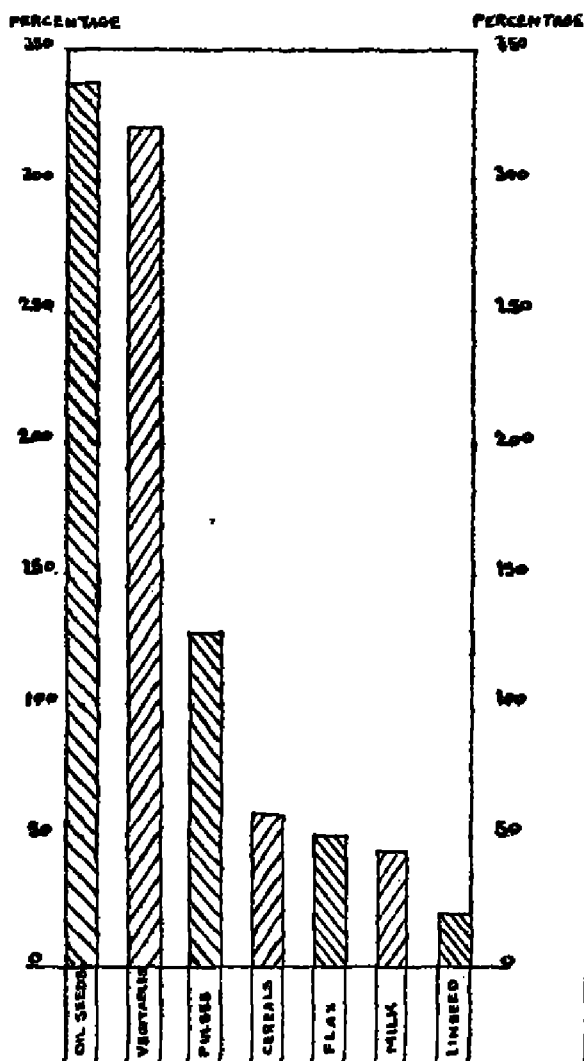


TABLE XXIII

Annual Production Targets

(Figures in lakhs of maunds. For Footnotes, see next page.)

Commodities	Present Production	Yearly Requirements for Target for Production				
	Average per annum (1934-9)	Nutritional Self-suffi- ciency ¹	Exports ²	Other needs ³	Quantity per annum in 1951	Percentage increase over the present
A. FOOD ARTICLES						
1. Cereals	318.2	225.2	137.6	142.2	505.5	58.7
2. Pulses	22.0	31.4	13.7	5.0	50.1	127.7
3. Oil-seeds (excluding Linseed)	11.3	42.0	..	9.0	51.0	351.3
4. Vegetables	11.0	42.2	..	4.0	46.2	320.0
5. Fruits ⁴	0.6	21.1	..	..	21.1	340.0
6. Milk	173.1	249.8	..	..	249.8	43.3
7. Sugar	2.8	21.1	..	..	21.1	653.6
Total	539.0	632.8	151.3	160.2	944.3	75.2
B. RAW MATERIALS						
8. Linseed ⁵	3.4	..	2.7	1.4	4.1	20.6
9. Cotton ⁶	16.2	..	1.8	14.4	16.2	..
10. Flax	1.5	..	..	2.2	2.2	46.7
Total	21.1	..	4.5	18.0	22.5	6.6
Grand Total	560.1	632.8	155.8	178.2	966.8	72.6

TABLE XXIV
Targets for average yield per acre of principal crops

Crop	Present yield	Target yield	Percentage of increase envisaged in the Plan
Rice	600 lbs.	1000 lbs.	66
	950 lbs. (irrigated)	1200 lbs. (irrigated)	26
	500 lbs. (unirrigated)	600 lbs. (unirrigated)	20
Jowar	793 lbs. (irrigated)	1200 lbs. (irrigated)	51
	476 lbs. (unirrigated)	600 lbs. (unirrigated)	26
Maize	635 lbs.	1000 lbs.	57
Gram	500 lbs.	600 lbs.	20
Groundnuts	800 lbs.	1000 lbs.	25
Pulses	400 lbs.	800 lbs.	100
Sugar-cane	12-15 tons.	30-55 tons.	100 to 350

also when properly extended add considerably to the agricultural yield.

*Possibility of Percentage Increase of
Agricultural Production*

1. By improved crop varieties, implements, manuring and farm practices 23
2. By reclamation of culturable waste other than fallow (representing more than 25% of the cultivated area) 25
3. By extension and improvement of irrigation . . . 25
- Total 73

(Footnotes to Table XXIII)

1. Calculated for an estimated population of 45.7 lakh persons in 1951 on the basis of standard diet aimed under the Nutritional Target.
2. Based on the need of creating a higher purchasing power to raise the standard of living of the rural masses by assuring 50 per cent increase in the export of ghee and 4 times in that of cereals and pulses; no increase in that of linseed, and 50 per cent decline in that of cotton, over the pre-War averages.
3. For cattle, seed, losses in storage and assembling, etc. and for manufacturers in the case of raw materials for industries.
4. The figure for present production has been given in bighas.
5. It has been presumed that the output of the linseed oil industry will be doubled.
6. On a basis of 15 per cent increase over the pre-War average in the intake of local factories.

Hereditary tenancy, fair rent and rationalization of marketing methods and practices will elicit more agricultural initiative and enterprise, lead to increase of capital investment on the land, and also add materially to agricultural out-turn. Fair prices for agricultural produce have to be ensured in order that adequate agricultural production can be maintained. In agricultural countries in the West, the State by fixation of prices, grant of subsidies and encouragement through co-operative societies and marketing organizations, has enabled the farmer to obtain a fair and adequate return for his produce. During the War this programme has been extended and amplified a great deal for obtaining a planned increase in agricultural production. In Gwalior too prices of the major food grains have been fixed. It appears, however, that the parity between the prices of wheat and of other cereals was not properly conceived when fixing prices ; and this may have been one of the causes of decreasing wheat cultivation in the State in recent years. In planned agricultural production in Gwalior the price of an important and nutritive cereal like wheat should be fixed on a scale that gives adequate returns to the wheat-grower in comparison with cheaper substitutes for wheat such as jowar and gram requiring smaller agricultural outlay. Not only for wheat but also for all other major crops and dairy produce the reorganization of marketing methods and practice is essential for assuring fair prices to the producer. In Gwalior we have about 40 regulated mandis and also a separate marketing department of the Government. The work of the marketing department should be extended and amplified so as to include the following :

1. Dissemination of market intelligence.
2. Grading and marking in the assembling markets.
3. Introduction of standard weights and measures throughout the State.
4. Supervision of licensed warehouses which may be established for storing agricultural produce.
5. Introduction of standard contract terms regulating the tolerance and limits of rejection for

damaged agricultural produce.

6. Introduction of standard containers.

All such measures are expected to react favourably on guaranteeing the cultivator fair and adequate returns. None of these can be omitted in any scheme of planned increase of agricultural production.

Improvement of all types of irrigation, and systematic erosion control will speed up agricultural development, especially in the backward and vulnerable districts. It is estimated that (a) Reclamation of the culturable waste land, and (b) Expansion of irrigation by new gravity canal systems, by masonry- and tube-wells, and by contour bunds and small tanks for impounding surplus monsoon rainfall, will each secure 25 per cent additional agricultural out-turn, leaving a balance of about 25 per cent to be obtained by improved agricultural methods.

The fixation of all these practical agricultural targets and the carrying out of co-ordinated programmes in the total Plan will be invaluable in speeding up agricultural prosperity for the all-round improvement of the standard of living of the masses.

It cannot be too strongly emphasized that the expansion and improvement of agriculture in Gwalior as represented by an increase of production of cereals by 58.6 per cent, of pulses by 128 per cent, of milk by 44 per cent, etc. will lead to the abolition of malnutrition and considerable improvement in health and physique. The population cannot secure food and housing on a health standard unless the food production is geared up to consumption requirements. Thus reaching the target for agriculture is the first step towards reaching the targets for health, leisure and welfare. For any Province or State in India improvement of agricultural production is the first part of the task of economic planning, calling for as intensive and systematic an effort as that required for munitions production during a war.

CHAPTER VII

OIL-SEEDS AND OIL INDUSTRY

For all agricultural countries it is always advantageous and economical not to export oil-seeds either raw or in the form of oilcakes, as this means a serious drain of nitrogen. Oilcakes should be used in the fields and consumed by the cattle population as much as possible, specially in areas where there is chronic shortage of both manure and fodder. Vegetable oil and fats of all kinds produced in the oil mills would also support soap, paint, varnish, linoleum, lubricants, alluminent and other industries.

Gwalior's total area under oil-seeds is 4,26,000 acres and is thus greater than that of any other province in India. The acreage under linseed in Gwalior is about a lakh and the yield of linseed cultivation is 5,06,000 maunds or about 18,000 tons, out of India's total production of about 4,20,000 tons. The sesamum acreage is about 2,40,000 acres, that is, about 10 per cent of India's total acreage under this crop. The production here is 33,320 tons as against 4,20,000 tons for the whole of India.

In other oil-seeds, namely rape, mustard and groundnuts, particularly the last, Gwalior is poorer. Gwalior's rape and mustard production is about 6,000 tons and that of groundnut about 5,200 tons.

The importance of linseed production in the State will appear from the following table :

TABLE XXV
Production of Linseed in the major producing areas
(in thousand maunds)

United Provinces	157	Bengal	27
C. P. and Berar	103	Hyderabad	41
Bihar & Orissa	87	Gwalior	18

The distribution of oil-seeds and of oil mills in the State is indicated below :

TABLE XXVI
Distribution of oil-seeds & oil-mills in Gwalior

Districts	No. of mills	Rabi oil-seeds (area in bighas)	Kharif oil-seeds (area in bighas)
1. Goona	5	66,789	52,652
2. Bhind	7	62,477	20,485
3. Bhilsa	2	60,470	16,413
4. Ujjain	..	45,233	9,017
5. Morena	3	31,515	22,300
6. Sheopur	3	27,402	65,089
7. Mandsaur	2	22,090	17,605
8. Gird	4	21,921	57,051
9. Shivpuri	..	14,182	1,52,061
10. Sardarpur	..	10,429	8,561
11. Shajapur	..	10,271	12,168

Many of these establishments are run in association with flour mills and are on a cottage scale. There is great scope in Gwalior for the manufacture of linseed oil and for the establishment of industries based on it. Linseed oil is consumed widely in Gwalior and it may be estimated that about two-thirds of the total production is utilized for edible purposes. Gwalior exports about 3,20,000 maunds of linseed, or 1,14,000 tons which is more than half of India's total export of linseed, viz. 2,16,000 tons (India's average export between 1928 and 1938). This large quantity could have been utilized to offset the scarcity of ghee or for the development of various industries that utilize linseed oil. Linseed oil is in demand in India chiefly for the preparation of paints and varnishes and in some measure for the manufacture of printing inks, oil-cloth and waterproofs. Both the Gwalior Paint & Chemical Industries at Lashkar and the Gopal Das Laxmi Narain Shrikrishna Oil Mills at Shivpuri have, however, concentrated on the manufacture of linseed oil. There is great scope for the manufacture of more linseed oil in Gwalior, particularly in Bhilsa, Ujjain and Guna. Apart from the obvious economic advantages of exporting lin-

seed oil rather than linseed and linseed cake, industries like paint, varnishes and lubricants have a steady demand from the railways, engineering works and the Public Works Department. In future the demand for linseed oil for industrial purposes will greatly increase while at least for some time to come the manufacture of paints and varnishes, inks and oil-cloth has opportunities of development that should be made the best of.

For the purpose of such development the following changes in the tariff schedule may be suggested :

(i) The export duty on vegetable oil of 6 as. per md. should be abolished.

(ii) The export duty on oilcakes should be raised from 2 as. to 6 as. per md. ; and a subsidy per md. of production of linseed oil at a rate of 8 as. per md. should be given by the State.

Gwalior's pre-eminent position in respect of the production of oil-seeds in India justifies a policy of production for oil and allied industries by means of subsidy and other facilities guaranteed for an initial period of 10 years.

The sesamum production in Gwalior is about 9,33,000 mds. out of which she exports some 66,000 mds. on an average. On the other hand 85,000 maunds of vegetable oils are imported for home consumption. A better economic adjustment will be to cease exporting sesamum and improving the manufacture of the oil so as to obtain a greater percentage of the oil on extraction through the use of expellers, operation of rotatory kolhus and introduction of improved ghanies. The soap industry based on the utilization of sesamum oil could also develop and meet the demand of the home market. The tariff schedule should also be modified with a view towards the improvement and development of sesamum oil industry.

(iii) The export duty on sesamum oil-seeds should be raised from 8 as. to Re. 1-8 per md.

(iv) The export duty on vegetable oils should also be raised from 1 anna to Re. 1 per md.

(v) The export duty on oilcakes should also be raised from 2 as. to 8as.

The other oil-seeds are not so important. The area under rape and mustard is about 25,000 acres, yielding on an average nearly 1,66,000 mds., of which about 92,000 mds. are exported. Rape or mustard oil is not very much consumed by the people, hence a considerable portion of whatever little is produced is exported to neighbouring parts. Rape and mustard cultivation can be increased a great deal in such wheat producing districts as Guna, Bhilsa and Ujjain and a thriving oil industry for crushing rape and mustard may be developed in such areas. Since the markets would be outside the State, at least in the beginning, the tariff schedule should be so modified as to help a development of the industry.

The export duty on mustard oil should therefore be removed ; while that on oilcakes should be raised from 2 as. to 8 as. per md.

The area under groundnuts is about 15,000 acres and the output is about 1,50,000 mds. The State represents a deficit area and imports more than what she exports. The quality produced is also not good. Hence there are not very bright prospects of the development of a groundnut industry in this State, particularly so because there is not any considerable local demand for groundnut oil. Likewise, the establishment of an industry for the manufacture of hydrogenated vegetable oils may not prove a very sound proposition at the present stage.

To sum up, it may be stated that the development of linseed oil industry on a large scale should be taken up immediately, particularly in Bhilsa, Ujjain, Sheopur and Guna. Modest scale sesamum oil mills seem to have very bright prospects in Shivpuri, Guna, Gird and Sheopur ; whereas few rape oil factories await development in Bind and Guna. The development of an oil industry in Shivpuri and Guna, which together grow about a third of the total oil-seeds grown in the State, depends on a proper exploitation and improvement of the present transport facilities.

Apart from the fact that the development of the oil industry will indirectly effect an improvement in the standard of cultivation and nutrition of men and cattle, it will

LOCALISATION OF OIL-SEEDS GROUNDNUT, LINSEED, SESAMUM

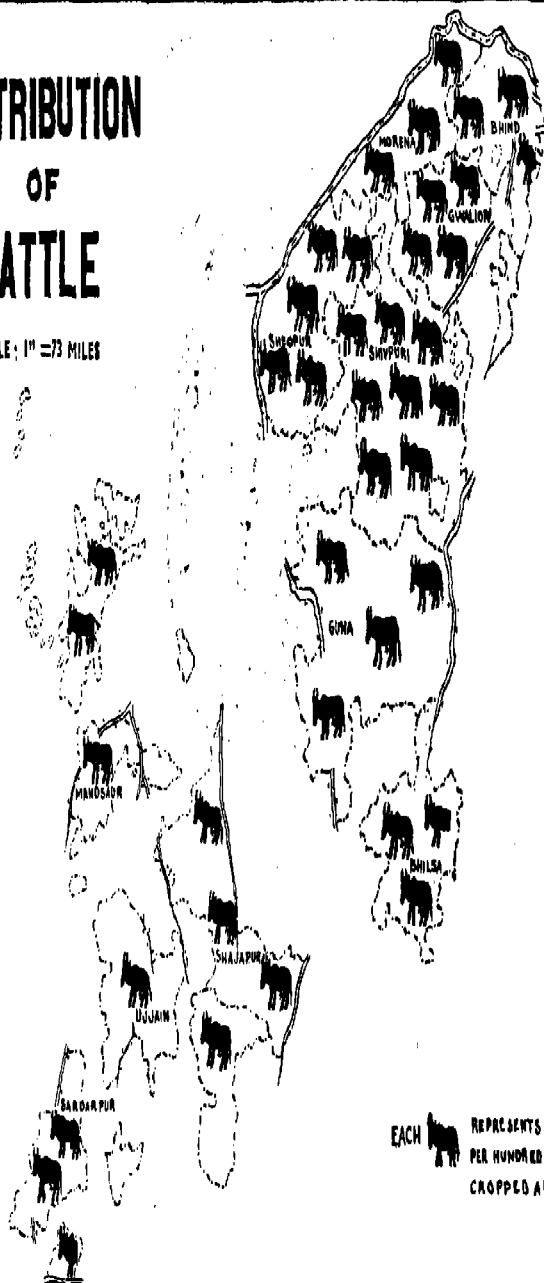


DIAGRAM X

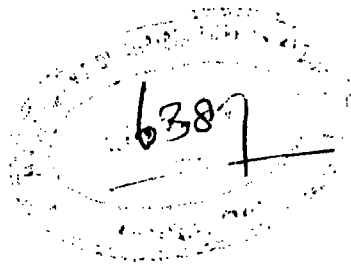
PREPARED BY
SHYAM NARAYEN DRAFTSMAN

DISTRIBUTION OF CATTLE

SCALE: 1" = 7.5 MILES



give rise to a number of other subsidiary industries based on it. Inferior grades of sesamum oil can be utilized for the manufacture of soap, while for the manufacture of soft soap there is nothing to excel linseed oil. It has already been pointed out as to how the development of such industries as paint, varnish, oil-cloth, waterproof, etc. depends on the progress of the vegetable oil industry.



CHAPTER VIII

CATTLE IMPROVEMENT

Agriculture and animal husbandry are linked with one another and the progress of one is allied with that of the other. There is no doubt that in Gwalior the breed of cattle has been fast deteriorating, leading to inefficient draught power and decline of milk yield ; and in such districts as Gird, Shivpuri, Sheopur and Guna in Gwalior Prant, the situation calls for immediate remedy. In such districts the milk yield of the cows is small while the bullocks are puny and light. On the other hand, everywhere the number of uneconomical and superfluous cattle is very large and on the increase and there is seasonal starvation for the cattle, especially in the treeless villages of such districts as Bhind and Morena. From March to June, when there is complete drying of grasses, there is much thinning out of cattle population due to both starvation and disease.

The three important breeds of cattle in Gwalior are the Malwi, the Bhindi which is a mixture of Mewati and the local strain, and a strain of the local Bundelkhand breed. The last is often called the Dangi breed which is met with in the hilly areas in Sheopur, Gird and Shivpuri in Gwalior and in Jham and Lalitpur in the U.P. The breeds in Gwalior Prant have become greatly mixed.

There is in the first place an urgent need of a cattle survey that will indicate what are the useful local types of animals and which stock should be selected for grading up by proper breeding. In some localities only the draught breed, in others only the milch breed and in still others the dual purpose animal may have to be selected for breeding. All this can only be ascertained after a careful cattle survey and the requirements of different regions. It is only on the basis of adequate statistical information in respect of the local breeds of cattle and the needs of population that a scientific programme of cattle improvement can be formulated.

It is probable that two or three local breeds might be isolated and selected as a result of surveys in Gwalior Prant alone ; and the plan of cattle improvement would be to make a beginning of selection and development as soon as a local breed is discerned capable of great improvement with mixture of such established and suitable strains as the Hissar cattle and the Murrah buffalo. For Malwa Prant of course the Malwi breed itself is capable of great improvement through the familiar methods of inter-selection and breeding and the castration of all scrub animals in the region.

After the cattle surveys are undertaken, Government farms should be established for bull-breeding and for the supply of stud animals to the villages. The Malwi cattle is regarded as a purely draught breed. There is already a special farm maintained at Ujjain for the breeding and improvement of Malwi cattle. The Veterinary Department has suggested that there should be three bull-breeding farms at Lashkar, Guna and Ujjain (either at Suwasara or Agar), (Scheme No. 45). For Gwalior Prant the milch type that seems most suitable is the Thar-Parkar breed Sindhi. The Thar-Parkar is a successful milch breed ; besides, it produces bulls which will be very useful in grading up the nondescript type of animals that are mainly maintained for milk production in large numbers.

For the milk supply of towns an appreciable number of buffaloes is also maintained. The buffaloes of Murrah should be maintained in the bull-breeding farms. The record male progeny will then be utilized for grading up the local buffaloes. The Kuno breed of Sheopur in particular is capable of great improvement through crossing with Murrah, and a breeding station for this purpose should be set up.

It might be pointed out that it is necessary to run the experimental bull-breeding station and the dairy farm as integral parts of one and the same scheme. Thus both purposes will be served economically, viz. the general improvement of cattle wealth through the distribution of proper pedigree bulls and the production and supply of milk

on a large scale according to hygienic methods.

To enable the rural areas to profit quickly from the distribution of pedigree bulls, a system of subsidy to solvent cultivators, who would be responsible for the proper care and maintenance of bulls and cows, has to be devised on the lines adopted in Baroda State. The Government may give certain assistance, for example, by providing sheds to hold the male calves of various ages, by improving water supplies, and by giving on loan several cows, young calves and a bull to be maintained by the cultivator, the agreement being that the owner will raise the male calves as produced by the herd, or, failing sufficient numbers, as may be supplied by Government and selected as likely to be fit for breeding purposes later, from the age of 6 months till about $3\frac{1}{2}$ years of age and fit for service. The cultivator will be paid at so much per male calf raised by him and so much per head of maintenance according to an age standard. All cost of maintaining the herd and feeding the necessary concentrates will rest with the cultivator. He will be permitted to dispose of all milk other than that required to raise the young stock. Regular and systematic records of breeding and feeding should be maintained by the owner.

But even systematic efforts towards cattle breeding and improvement are bound to be futile if the rural population does not take a commonsense view of animal keeping. Excessive cattle population and its continuous increase cause an increasing fodder scarcity in the State, and where fodder is chronically deficient the conditions become, indeed, more unfavourable for the superior stock than for the average animal. On the other hand, adequate feeding of cattle produces the quickest result in the direction of cattle improvement. According to Burns, ordinary village cows will produce on an average 50 per cent more milk if they are maintained on an adequate ration. The establishment of village groves in such districts as Ujjain, Mandsaur, Shajapur, Bhind and Morena, which have little or no forests that may act as fuel and fodder reserves, will improve fodder supply and nutritional standards of

the cattle population and at the same time prevent the burning of cow-dung. Scheme No. 50 deserves careful consideration in this connexion. In these village plantations regulated or rotational grazing on scientific lines will have to be adopted on the one hand, and on the other the number of uneconomical cattle will have to be controlled.

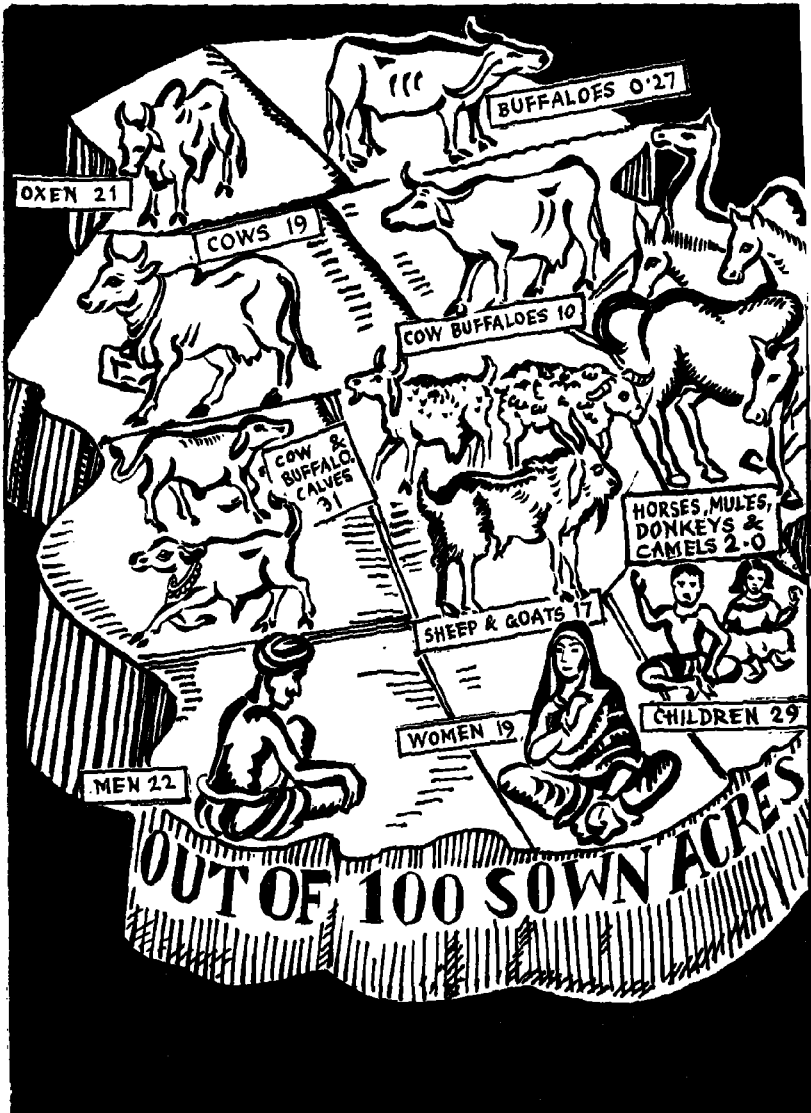
The climate of Egypt is similar to that of Gwalior. On the basis of the Egyptian standard of draught power of 25 cattle (including bullocks, cows, calves and he-buffaloes) per 100 acres sown, i.e. one animal for about 8 bighas, we require for the cultivation of about 1,14,00,000 bighas in Gwalior (excluding the feudatory areas) 14,25,000 cattle. Instead we have 33,91,643 cattle. District by district the number of cattle per 100 acres of crop area is given below :

TABLE XXVII
Cattle population of Gwalior

District	Total cattle population	Net cropped area (in acres)	No. of cattle per 100 acres of cropped area
1. Gird	2,84,082	3,45,221	82
2. Bhind	2,26,040	4,85,698	47
3. Morena	2,71,624	4,50,133	60
4. Sheopur	1,64,490	1,67,665	98
5. Shivpuri	6,93,693	4,25,647	163
6. Guna	3,91,892	4,69,368	83
7. Bhilsa	2,56,832	4,70,602	55
8. Shajapur	3,28,935	5,40,411	61
9. Ujjain	2,41,141	5,69,007	42
10. Mandasaur	2,07,998	3,41,054	61
11. Sardarpur	91,422	1,81,599	50

Cattle population in excess of 25 per cent per 100 acres of sown area is superfluous and uneconomical and may safely be reduced by legislation for compulsory castration of all working bulls and scrub animals and removal of the present ban on the export of cows. Where both improved bulls and cows are scarce artificial insemination holds great opportunities for the quick improvement of the cattle—a method successfully adopted in the U.S.S.R.

PRESSURE ON THE LAND



The improvement of cattle also rests largely on the improvement of dairy production on scientific lines. Gwalior with her considerable proportion of culturable waste and grass lands has exceptional opportunities for developing a creamery region that will have ready markets in the Provinces of Bombay and the U. P. ; in fact, Gwalior's normal export of high grade ghee is already considerable. Mixed farming based on the combination of fodder crops with dairying holds great promise in such districts as Shivpuri, Guna, and Sheopur. Bhind and Morena which are now the most important ghee producing centres of Gwalior can develop further their output of milk and milk production through a more intensive system of cereal production combined with dairy farming. The following table gives estimates of ghee production and exports from the main producing centres :

TABLE XXVIII
Ghee Production and Export

District	Estimated production (Mds.)	Quantity export- ed in the pre- War period (Mds.) 1935-6
1. Bhind	85,170	13,520
2. Morena	1,07,000	17,600
3. Sheopur	29,590	1,539
4. Shivpuri	62,300	5,555
5. Guna	55,540	13,228

For the proper development of dairying, buffalo-keeping and breeding will have to be specially encouraged and the present ban on the export of ghee abolished. It is also necessary to establish ghee grading stations, especially at Morena, Bhind, Pichor and Shivpuri.

There are about 47 lakhs of livestock in Gwalior State. It has been computed by the Royal Commission on Agriculture in India that the treatment of every 24,000 animals should be entrusted to one veterinary graduate.

On this basis Gwalior will require 200 qualified veterinary surgeons. There are, however, only 47 veterinary dispensaries in Gwalior State. The treatment of livestock is left largely in the hands of quack doctors. The establishment of new dispensaries and the strengthening of the staff of veterinary surgeons and inspectors are essential in order to fight cattle epidemics and diseases. (Schemes Nos. 47 and 48.) Compulsory castration should also be introduced, and a Livestock Improvement Act passed in this connexion. Cattle disease and nutrition researches as envisaged in Scheme No. 8 should also form an integral part of the working of the Veterinary Department.

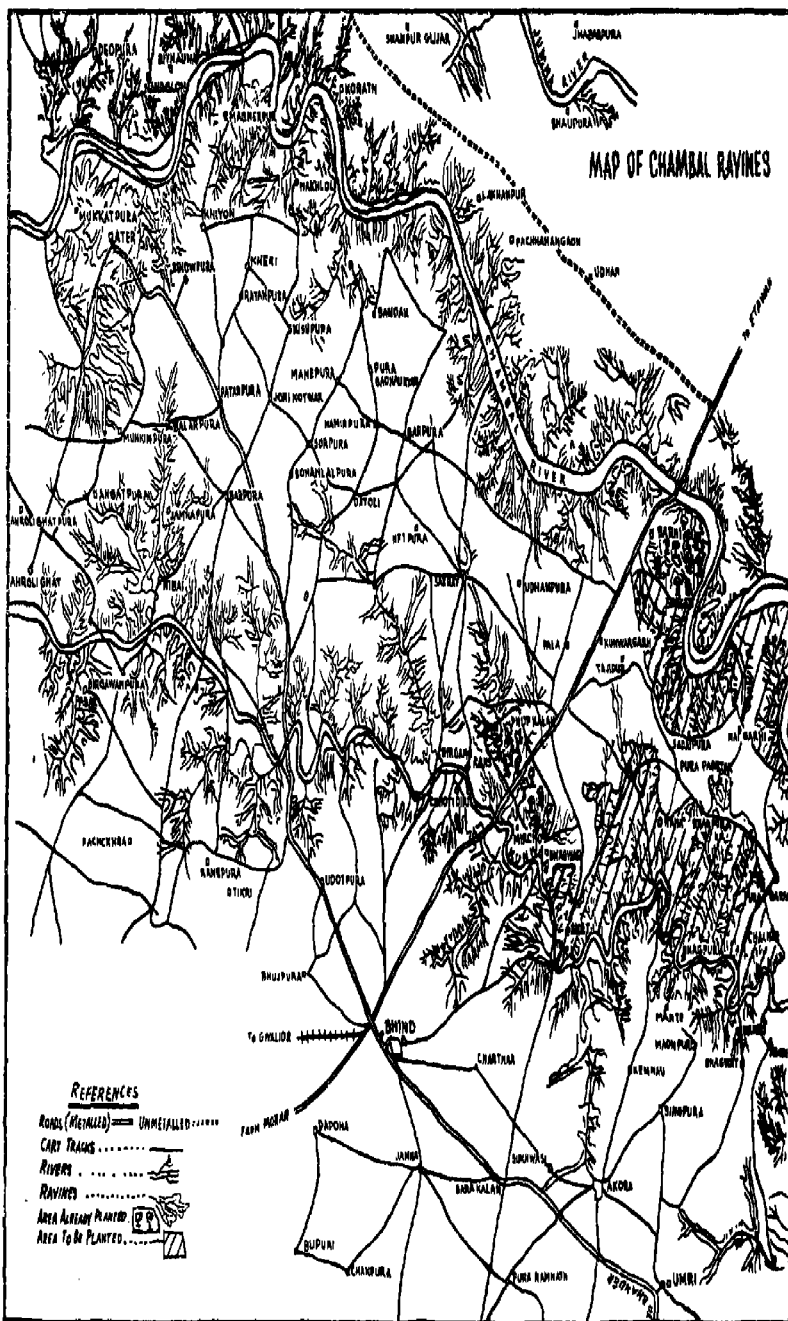


DIAGRAM XII

CHAPTER IX

EROSION CONTROL

Soil erosion under the peculiar conditions of topography and climate of Gwalior is the greatest single menace to its prosperity. Erosion and run-off that continued unchecked for centuries are now responsible for the loss of some of the most fertile stretches of land in the north. The following would show the distribution of the ravine lands in the northern districts :

TABLE XXIX

District	Chambal Right Bank in sq. miles	Kunwari			Total of District in sq. miles
		Right	Left	Total	
Bhind Morena Sheopur	74.23	112.51	83.54	196.05	270.28
	246.25	68.53	72.83	141.36	387.61
	96.4	..	..	..	96.4
Total	416.88	181.04	156.37	337.41	754.29

The Chambal and the Kunwari are alone responsible for ravine formation covering 12.3 per cent of the total area (6,108 sq. miles) of the three districts. The eroded lands resulting from the action of the other rivers, particularly the Sindh and the Kuno are not included in the above table.

For several decades the evil of the extension of ravines has been realized and investigated. In fact the labours of Behad Commission have been note-worthy in this connexion. As a result of its recommendations the first systematic attempt towards erosion control was initiated about 15 years ago through the afforestation schemes at Barai and Kunwari.

It should be pointed out in this connexion that not only the Chambal river but many other rivers of the State such as the Sindh, Parvati, Kalisindh, Betwa, Vesli and Pahuj are eroding and scouring valuable cultivated lands

and rendering the life and toil of the farmers ever more and more difficult. The erosion situation is at its worst in the districts of Bhind and Morena due to the deepness of drainage channels not only of the Chambal but also of its various tributaries and the sandy or loamy character of the soil.

The worst district stricken by ravines is Morena, where their distribution among the parganas is shown as follows :

TABLE XXX
Ravines in Morena District

Pargana	Area under cultivation (in bighas)	Area under Ravines (in bighas)
Ambah	2,82,781	1,52,539
Jaura	2,52,256	1,22,680
Morena	2,33,425	1,01,410
Sabalgarh	2,02,533	1,10,650
Total	9,70,995	4,87,279

The total land area of Morena is 21,31,902 bighas, of which the cultivated area (9,70,995 bighas) comprises 45 per cent and the ravines (4,87,279 bighas) comprise as much as 23 per cent. Ravine territory is more than half of the arable area of this district. Similarly in Bhind and Sheopur districts the ravine area is distributed as follows :

TABLE XXXI

Pargana	Area under Ravines (in bighas)
<i>Bhind Dt.</i>	
Mehgaon	1,91,666
Lahar	39,511
Gohad	1,09,749
	29,703
Total	3,70,629
<i>Sheopur Dt.</i>	
Sheopur	52,540
Bijaypur	66,749
Total	1,19,289

It is necessary that an aerial survey of the ravine territory should be undertaken so as to estimate accurately the extent and depth of the ravines and present uses of the land, especially in the districts of Sheopur, Bhind and Morena. Without such an exploratory survey the right type of erosion control measures necessary for particular eroded tracts and catchment areas of the various rivers and minor streams cannot be ascertained.

Year in, year out, villages in these districts are losing more and more of their fertile fields and villages ; homesteads are split up and disappear. The evil does not stop



RAVINES

here. The excessive run-off of water has led to a gradual fall of the sub-soil water level, which in certain areas in Bhind and Morena has gone down to depths of even 150 to 250 feet. As a result not only have many wells been thrown out of use but certain valuable crops like wheat and cotton can no longer be grown. Recently a decline has been marked in acreages under wheat, barley and gram for all the three districts of Bhind, Morena and Sheopur. Many villages are now without any wells and suffer from a chronic scarcity of drinking water. The aching scene of desolation of hundreds of miles of ravines that look like a barren wavy sea has its counterpart in a marked and quick deterioration of fertility and standard of living and

SOIL EROSION

CAUSE I



DEFORESTATION

farming in the entire tract bordering the ravines and in the more or less complete destruction of pasturage.

The menace was allowed to expand on all sides without hindrance to such an extent during the past that the strategy of its control has now to be somewhat modified. Much land is already so ruined by deep gullies and ravines that it is no use spending money for their control and stabilization. Following the experience of the United States and also of erosion control in the Hoshiarpur chos and in Bijapur in the Bombay Presidency, it is recommended that seven Soil Stabilization Circles should be formed with centres at Jaura, Morena, Khera, Ambah, Barai, Ater and Mehda. Scheme No. 9 should be suitably enlarged and modified.

The programme of work would be to distinguish carefully between lands completely ruined for cultivation and lands fit for cultivation on the fringes of the gully fingers that are irresistibly combing out the fertility and moisture of the land and steadily approaching the village site. In the interior, in the midst of the cultivated fields the mischief of gullying starts in natural slopes and fold depressions or in furrows and ruts, gradually diminishing the cultivated area at the higher levels and scouring and destroying the grass lands and woodland at lower levels. The operations will therefore consist largely of bunding, terracing, contour-trenching, channelling and seasonal planting of defensive grasses such as common munj and bhabar that can bind the soil and fix even steep slopes. Trees alone cannot stop erosion. A protective cloth of grasses is an effective preventive for run-off and hence of soil erosion. It builds the soil on which trees grow. There will be moving labour squads, led by the Forest Officer throughout his circle from one vulnerable point to another quickly eliminating the menace of fresh scour and gullying by contour bunding and channelling, and planting tufts of munj, bhabar and other grasses at the time of monsoon. In a 5 per cent slope of the land under the conditions of rainfall, as in Gwalior, contour bunds should be built at distances of every 300 feet in the cultivator's fields, to pre-

vent run-off. The bunds should be about 4 feet high with a top width of 1 foot. This would be the only successful method by which fresh destruction of cultivated areas and villages through which deep gullies are cutting headward could be checked and would involve constant co-operation with the landlords and cultivators among whom Rural Reclamation Panchayats are proposed to be established. As these preliminary operations of soil defence and conservation progress, the planting of protective grass and forest reserves will be the next step for conservation of the land.

These operations have to be aided by the closure of these circles to felling and clearing of vegetation for fuel and timber and to grazing of any kind and if possible by the complete prohibition of goat-keeping.

The Punjab Land Preservation (Chos) Act of 1900 includes a list of the following prohibited acts that lead to the erosion and denudation of the soil :

(i) The cleaning or breaking of cultivation not ordinarily under cultivation....provided that the breaking up of the land for cultivation may be permitted by the Forest Officer.

(ii) The admission, herding, pasturing, or retention of sheep and goats, provided that in cases where sickness necessitates the keeping of goats for milk, the Forest Officer may issue a permit at his discretion for the retention of a limited number of stall-fed goats for a specified period.

(iii) The collection or removal of grass for any purpose, provided that the Forest Officer may permit the cutting or sale of grass from such portions of the notified area in which grass may have sufficiently established itself.

(iv) The pasturing of any cattle other than sheep and goats.

Unless and until cultivation and the retention of goats and sheep are prohibited, the destruction of land cannot be checked in certain severely eroded tracts in the districts of Bhind and Morena. The increase of livestock population in all the three districts of Bhind, Morena and Sheo-pur is given below :

TABLE XXXII

	Sheep and Goats		Cattle	
	1920-21	1940-41	1920-21	1940-41
Bhind	73,087	1,10,371	2,51,000	2,77,800
Morena	91,266	1,28,455	2,68,008	3,38,800
Sheopur	41,694	47,511	1,18,065	1,75,995

It need hardly be pointed out that excessive grazing by

SOIL EROSION

CAUSE II



OVER-GRAZING BY CATTLE & GOATS

flocks and herds is one of the significant factors in speeding up soil erosion and destruction. On the other hand, grazing facilities will soon be available after a closure under a system of deferred and rotational grazing even on the ravined lands. Careful pasture management will thus counteract and at the same time mitigate the chronic fodder famine in the whole ravine-stricken area. Scheme No. 52, which aims at introducing rotational or regulated grazing

and improvement of pasture lands in order to check denudation and erosion will have to be suitably modified and enlarged in order to tackle successfully the problem of over-grazing and initiate a sound policy of preservation of pastures. Mixed farming, stall-feeding, cultivation of fodder crops, and reduction of cattle population form inter-linked features of a rational scheme of soil conservation and livestock improvement.

The specification of different types of land for different uses is essential for a programme of soil stabilization. Not merely grazing but cultivation also has to be controlled at critical places where the denudation of the soil starts from a ridge down the slope where the gully is formed and is enlarging itself. At the head of the ravine where the little fissure or finger-gully first makes its appearance in the middle of the cultivated lands, cultivators have to be guided to build terraces and contour bunds and plough along the contours, instead of up and down the slopes, in order to retain the soil in its proper place. Cultivation at and around the fissures or gully-fingers and on steep slopes should be stopped, and superseded by permanent grass. Straight line ploughing on a slope does great damage. The cultivation of certain crops such as small peas, jowar and bajra, gram and other legumes, clover, guar, alfalfa, bersem and various leguminous fodders has been found to be soil-binding. The cultivation of these erosion resistant and soil-binding crops along with light grains in long, narrow, parallel strips placed crosswise on the slopes has obvious advantages over the old system of cultivation which subject to erosion entire areas of large fields with long slopes. The erosion resistant crops as well as grasses best adapted to the locality have to be found out for planning a strip-cropping system in the entire ravine-stricken zone. Strip-cropping to control erosion which is a newer practice than terracing is easier, and should be generally practised on adaptable, moderate slopes. Special stress must also be laid on the consolidation of holdings, for neither strip-cropping nor contour tillage can be carried out without this. Cultivation should not be permitted in areas of

SOIL EROSION

CAUSE III



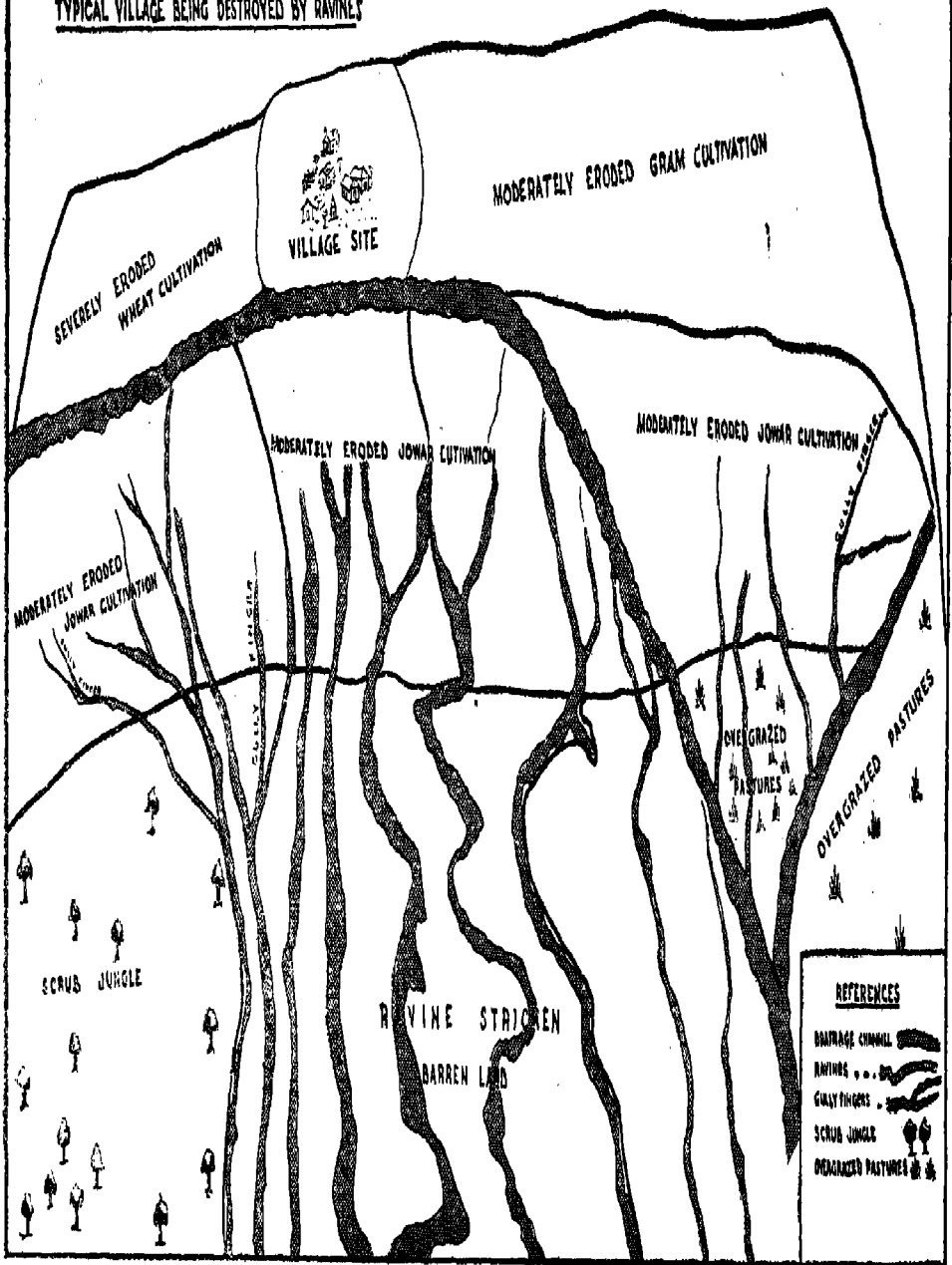
CULTIVATION IN SLOPES

denudation except on controllable, moderate slopes and bunding, terracing and channelling should assist farmers to control the run-off. Without such mechanical safeguards cultivation may do great damage to the soil that cannot be easily rectified. Steep slopes should be reserved for grass and forest under proper management that must include complete closure to grazing or rotational grazing according to the condition of the slope, soil and vegetation. Where wide gullies have formed enclosing a large area, contour bunding at the top, irrespective of the ownership of the land should be supplemented by the construction of spill or diversion channels with grass cover and the area enclosed within the gully levelled up for cultivation that has to be so managed that the soil is least pulverized and exposed to denudation and there is the largest absorption of water. Pasture management, afforestation and regulation of agricultural practice all should aid one another in soil conservation in the critical areas.

Apart from the advantages of the strip-cropping system, according to which narrow parallel grass strips are interposed between the cultivated contour strips and which is now widely adopted in the U. S. A. as an erosion control measure in 'bad' lands, methods of dry farming are essential wherever the run-off is severe. Whatever farming practices conserve moisture also contribute to check erosion. In the Bombay Presidency after constructing contour bunds for the preservation of moisture and prevention of erosion, the dry farming methods adopted are as follows :

The cultivator ploughs one-third of his holding per annum while the remaining two-thirds is harrowed once a month from June to September. A given plot of land is therefore ploughed only once in three years. The amount of seed per acre is reduced by 30 per cent, and the rows are planted $1\frac{1}{2}$ ft. apart instead of the usual 1 foot. The object of this is to provide each individual food-plant with more moisture and food than would be possible from thicker sowing. Soil working between the rows is done four times instead of the usual twice. Such methods of dry-farming, and more especially soil conservation farming if

TYPICAL VILLAGE BEING DESTROYED BY RAVINES



PLAN FOR EROSION CONTROL

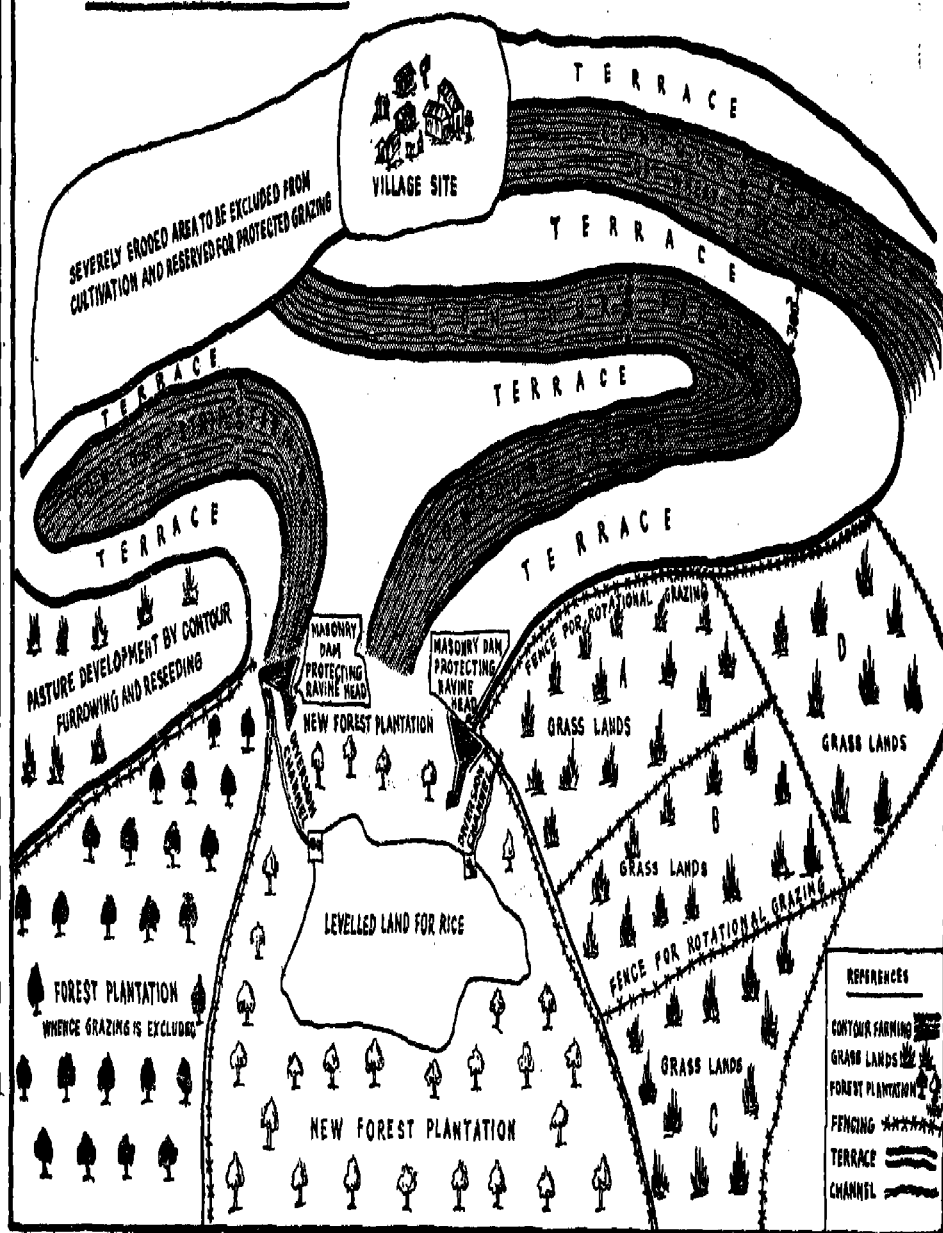


DIAGRAM XIV

adopted in Gwalior would contribute to preserve soil moisture and prevent evaporation and run-off.

It must now be realized that in Gwalior (as in parts of the U. P. on the banks of the Chambal) the broken ground is far too deep and extensive and the difference of level between the cultivated area and the riverine territory and river beds too great to permit engineering works and reforestation alone to have appreciable effect. Nor will afforestation on the flanks of the rivers be of much use because of the large tract of country that has been broken up in the interior. It is where the ravines are extending afresh far in the interior into the cultivated fields and village-sites that systematic erosion control could be successfully begun. With reference to the erosion control work in the Pabbi hills in the Punjab where the broken nature of the country resembles the ravine country on the banks of the Jamuna and Chambal, the Inspector General of Forests observes : "A great deal of gully plugging, contour trenching and artificial regeneration has been done at great cost, but excellent though it is, it is the vegetation, whether as a result of closure or artificial regeneration and not the engineering, which now very obviously has had the greatest effect." Similarly the Chief Conservator of Forests in a note records : "Trenching is far too expensive to be done on a large scale and dams, though certainly useful, are hardly required at this stage, as the greatest success is being attained by simple closure. Even this very broken ground is producing a crop of grass and bushes which will be of local value in addition to serving as a check to erosion. I do not want to say that trenching and gully plugging are useless but their effect is entirely subordinate to that produced by nature in re-clothing with grass and vegetation barren hill sides. Closure is essential, and engineering works cannot succeed without it or ever have comparable effect. This agrees entirely with the experience gained in the United Provinces on counter-erosion works in the ravines of Etawah (on the Jumna between Cawnpore and Agra) begun some thirty years ago. Contour trenching and the like is an excellent way of dry

farming to get regeneration, if it is necessary and if it is worth the cost, but as a method of erosion and flood control in these areas is of itself both expensive and ineffective." Closure to grazing and cultivation and the restriction or prohibition of certain crops and regulation of agricultural practices here are essential ; without these the engineering works at the mouths of ravines or in the slopes exposed to run-off will not be of much avail.

The programme is urgent, since further delay in defending the soil and the village against erosion and denudation is bound to make future defences difficult, if not impossible.

Measures that should be taken to repair and prevent the damage done by erosion in northern Gwalior may now be summarized and classified under five heads :

(a) *Economic*: (1) Removal of whole villages precariously perched on ravine tops or seriously threatened by gullies. All hamlets situated in badly eroded or threatened areas should be moved in an orderly manner to new lands. There will be about a hundred villages from Sabalgarh to Meheda now perched insecurely on gully heads whose removal may be necessary for the prevention of fresh destruction of cultivated areas and village sites in and around the critical slopes. (2) Plantation of village groves in the interior that will relieve the pressure of grazing in the eroded areas. (3) Provision of wells and tanks that will also remove the need for concentration of human and livestock populations.

(b) *Agricultural* : (1) Prohibition of cultivation at and around the gully fingers and on steep and fairly steep slopes. (2) Terracing of the slopes, ploughing and planting along contours. (3) Strip-cropping on moderately steep slopes. (4) Cultivation of soil-binding crops and fodder plants and exclusion of erosion-inducing and soil-depleting crops such as tobacco, cotton, maize, arhar, potatoes, etc. (5) Planting of wind breaks. (6) Introduction of mixed farming.

(c) *Veterinary* : (1) Closure of badly eroded areas to grazing by cattle, sheep and goats. (2) Improvement

METHODS OF EROSION CONTROL



I. AFFORESTATION

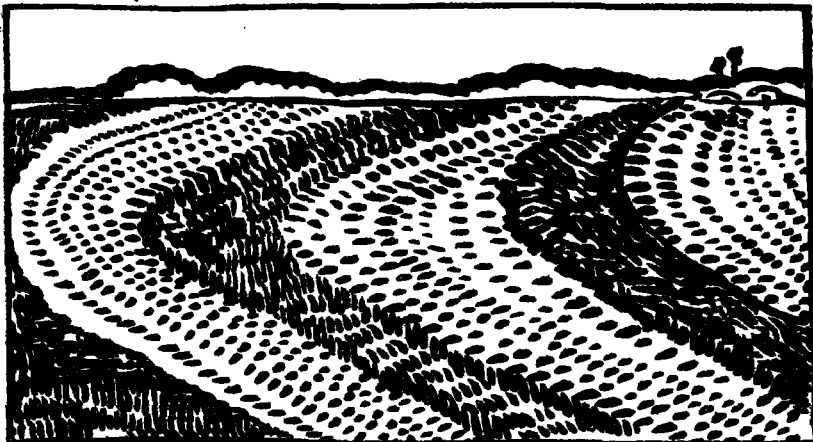
and regulated grazing of pastures. (3) Complete prohibition of goat-keeping. (4) Reduction or removal of the livestock population.

(d) *Sylvicultural* : (1) Establishment of forest reserves and re-afforestation of eroded or threatened areas, the trees being selected with reference to their quick growth, value as fuel and timber and rate of evaporation from leaves. (Scheme No. 10 deserves early implementation in this respect.) For afforestation work in the catchment areas of the rivers the co-operation of several other States, especially Indore, Kotah, Tonk, Datia and Bhopal will be necessary. Contour trenches will have to be dug on the higher denuded hill tracts and planted with forests. Larger bunds must be built at the bottom of the slopes and diversion ditches provided for the regulated run-off of water to the lowlands. (2) Establishment and improvement of defensive grass plantations in threatened areas, the grasses being selected with reference to their quick growth under dry conditions, edibility for cattle and soil-stabilizing qualities.

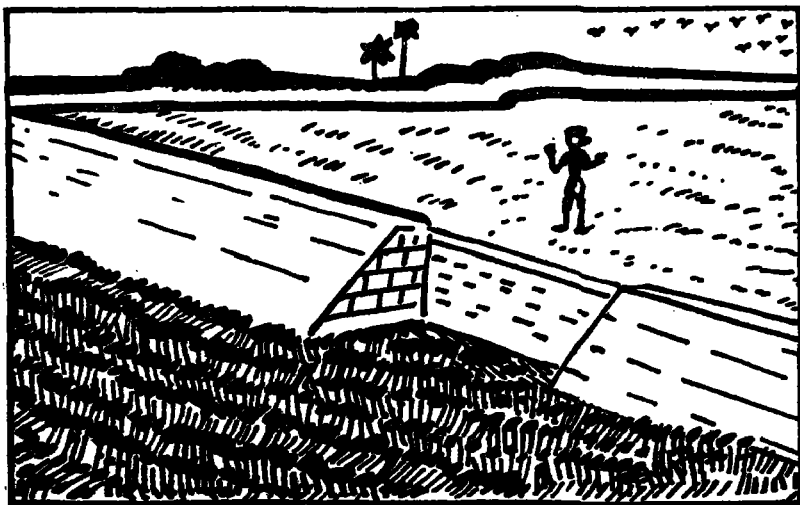
(e) *Mechanical* : Construction of terraces, bunds, contour trenches, dams and discharge channel ways. Various kinds of heavy earth moving machinery such as bulldozer tractors, tanks terraceers and sub-soilers may be utilized for easy and quick reclamation of large areas of ravine territory and in this connexion mechanical units that have been demobilized could be utilized as is proposed recently by the Punjab Government.

Most of these objects aid and overlap one another and an attack on all fronts has greater chances of success than isolated and piecemeal measures. Ravine Reclamation Panchayats should be organized for dealing with each particular eroded area that requires individual treatment or specific and appropriate control measures, in which the peasantry as a whole must be educated and induced to participate. The working plan for erosion control would be to compute carefully for each single village unit in an eroded area its total needs of firewood and pasturage. Level to level, the cultivated area would be protected against the

METHODS OF EROSION CONTROL



II TERRACING

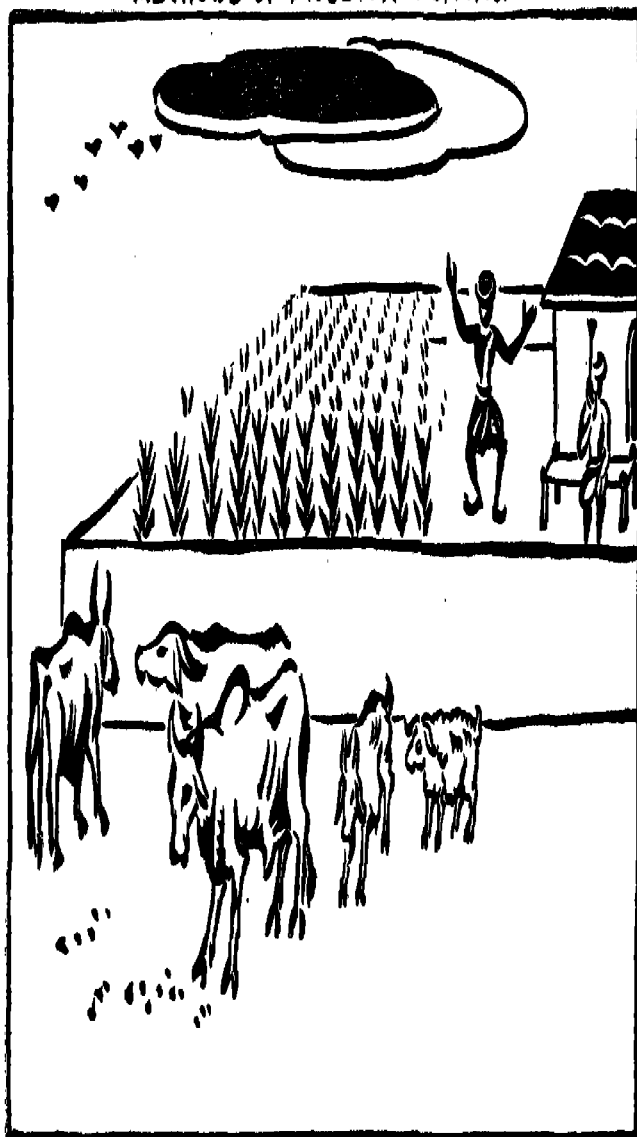


III BUILDING OF CONTOUR BUNDS AND DAMS

run-off by contour bunds erected at intervals of, say, 300 feet. All tillage should be along the contours of slopes ; and seeding, ploughing under cover crops and harvesting should be so managed that the land surface is exposed for the shortest possible time. Any surplus water could be intercepted by terraces or led through diversion ditches and spill channels in which dub grasses should be fertilized and planted so as to prevent quick run-off as in the original gully. Below the cultivated fields where the area becomes broken, cultivation should be prohibited and the ground reserved for the establishment and improvement of grasses for the village cattle under strict regulation and management. The grassland would form the frontier between cultivation and forestry. The woodland which would occupy the lowest portion of the slopes exposed to most severe erosive action should be artificially created or regenerated as fuel reserve for the village and completely closed to grazing. It could be divided into blocks and compartments assigned for groups of cultivators of the village at the top of the ravine for meeting their fuel requirements. At different levels of the slope cultivation, pasture management and forestry will accordingly be restricted to its appropriate ecological zone for adequate protection of soil and conservation of rainfall. The proper allocation of land uses according to soil, topographic and vegetative conditions is integral to any erosion-control plan, and this requires the co-ordination of the various sciences of the soil and of life.

In the planned strategy against erosion steady teamwork is essential. The economist will work out the total needs of the rural community in terms of crop, fuel and fodder and in relation to the aggregate land available for different uses for the longest duration. He will also seek remedies for tenurial conditions under which a large section of the agricultural community is forced into methods of land use which exhaust the soil. The agriculturist will introduce contour bunding, trenching and strip-cropping in place of erosion-inducing farming methods and reduce erosion to a point where losses are practically equalled by 'soil-building'

METHODS OF EROSION CONTROL



IV PROTECTION OF PASTURES AND WOODS AGAINST OVER-GRAZING

practices. It is the thin eroded soils that not only produce unremunerative crops but induce scouring and gullyng on steep or unusually long slopes. Where gullys have begun to form, the forester will be there to plant, at the heads of both the critical slope and the areas above and below it, trees that grow rapidly and that have quick evaporation from their leaves, as also soil-binding and drought-resistant grasses. The retirement of severely eroded cultivated lands to the permanent protection of trees or grass is in fact the major step for the prevention of fresh gullyng. The forester and the ecologist will have to work side by side. The ecologist will select the nutritive and drought-resistant grasses for stabilization and pasture improvement through rotational grazing, reduced grazing and mixed grazing. The livestock population will no doubt have to be drastically reduced in the ravine territory ; but the selected superior beasts that will remain can be nourished by regulated grazing in carefully managed pasture lands which, in erodible slopes, will take the place of cultivation for the protection of soil. The ranger will be aided by the veterinarian who will show the methods of disposal of superfluous and uneconomical cattle and wasteful goats. Finally, the administrator will enlist the co-operation of the peasantry organized in Ravine Reclamation Panchayats for the control of grazing and regulation of agricultural practice. The conservation of soil and the conservation of water which are intimately associated with each other, together touch the entire field of man's exploitation of the earth and thus a rational programme involves the highest amount of co-ordination of man's uses of trees, grasses, soils and waters in the background of his population pressure and standard of living.

APPENDIX

TO CHAPTER IX

It has been mentioned that the area subject to erosion in its different forms has not been surveyed at all in Gwalior. It is very essential that surveys should be conducted and the different degrees of sheet and gully erosion carefully examined and estimated. Further, the relation of erosion groups and slope classes to land use should also be examined. Many slopes too steep for cultivation are now used for crops. Following the methods adopted in the U. S. A. for soil conservation survey, it is suggested that in the northern districts of Gwalior the intensity of erosion and the uses of land for cropping and pasture should be examined. The following symbols may be used to estimate the slopes, the degrees of erosion and the various kinds of land use. The run-off of water increases with the slope. Slope classes may be expressed in percentages. A slope of 5 per cent, for example, has a fall of 5 feet in a horizontal distance of 100 feet. The slope classes are : A, less than 1 per cent ; B, 1-5 ; BB, 5-10 ; C, 10-15 ; D, 15-30 ; and E, 30 per cent or more. Sheet erosion may be estimated by comparing the existing thickness of the surface soil with the original thickness of the surface soil that can be obtained by studying fields and wood lands that have not been much cultivated. Symbols used to indicate the intensity of erosion are as follows :

Sheet erosion :

- (i) Less than 25 per cent of the top soil removed.
- (ii) 25-50 per cent of the top soil removed.
- (iii) 50-75 per cent of the top soil removed.
- (iv) 75 per cent or more of the top soil removed or all the top soil and upper part of the subsoil removed.

(v) All top soil and most or all of the sub-soil removed ; parent material may be exposed or eroded.

Gully Erosion :

(vi) Occasional gullys :—Occurring less than 100 feet apart.

(vii) Frequent gullys :—Occurring less than 100 feet apart but including less than 75 per cent of area delineated.

8. Very frequent, or

9. Destructively large gullys.

O. Indicates gullys too deep to be crossed by tillage implements, as 7, 8 or 9.

V. Indicates gullies, too deep to be crossed by tillage implements, that have penetrated into triable parent material as 7 V, 8 V or 9 V.

Lands should also be classified into :

(1) Crop land ;

(2) Pasture, which is open grazing land used by cattle, sheep and goats ; and

(3) Wood land which is covered 40 per cent or more by the spread of forest trees.

Cultivation has often extended to steep slopes, where it becomes largely destructive of the land and whence it should be altogether excluded, while many pastures if not closed for grazing are subject to severe erosion. Safe long-time farming and pasture management can only be based on a careful classification of land uses.

CHAPTER X

PLANNED CO-OPERATION

Agricultural progress is not possible without a sound system of credit and marketing. Private money-lending is usually associated with indebtedness of the peasantry which acts as a damper on their initiative and very often leads to inefficient farming and poor returns. In its worst forms, it reduces the real cultivators to the status of tenants and then to landless labourers, while the rapacious money-lender enters by the back door pulling down both the standard of farming and the standard of living and efficiency of the rural masses. No systematic inquiries into the indebtedness of the rural population have been undertaken in Gwalior. Mr H. M. Bull's survey of 2,833 families in 19 villages in different districts of Gwalior shows an average debt per family of Rs. 182-3. This inquiry relates to the pre-War period since when indebtedness may have been reduced.

TABLE XXXIII
Rural Indebtedness

Serial Village No.	District	Average indebtedness per family		Serial Village No.	District	Average indebtedness per family	
		Rs.	As.			Rs.	As.
1. Santanwara Kalan	Shivpuri	88	0	10. Ramsar	"	120	0
2. Lukwasa	"	144	0	11. Daulatpur	Ujjain	326	0
3. Mangrol	Morena	149	5	12. Ingoria	"	230	0
4. Bilgaon-Choudhary	"	141	9	13. Deo-ki-Khajuri	Bhilsa	384	0
5. Nurabad	"	222	0	14. Masoodpur	"	88	0
6. Pandola	Sheopur	71	0	15. Sawan	Mandsaur	214	0
7. Garhi	"	177	0	16. Ratangarh	"	206	0
8. Antri	Gird	257	0	17. Dhundorka	"	248	0
9. Penchi	Guna	141	0	18. Kanat	Shajapur	175	0
				19. Mangrola	"	80	0

In every village investigated, one of the most serious factors limiting agricultural improvement has been found to be lack of capital and proper credit facilities. This is aggravated during the recent War years by the marked increase of the prices of ploughs, cattle, and costs of agriculture generally. In the village Jhagar in Guna district, as many as 10 cultivators had to give up farming in the course of the last two or three years as they had not sufficient capital to carry on their farming. Conditions elsewhere are not different. Likewise, in the prevailing system of unorganized marketing, the long chain of middlemen, and the slump in prices at harvest time, together with a number of malpractices and merchandising charges, take away a considerable portion of the price paid by the consumers.

Efforts have been made as elsewhere in the country to organize agricultural credit through co-operation, although little has been done to extend co-operation to the marketing of agricultural produce. There are some 3,700 agricultural credit societies with a membership of 72,000. The number appears to be impressive, when it is remembered that the number of inhabited villages is only 10,625. On the whole, however, the societies embrace only about one-tenth of the rural population. Co-operative development is the least in the districts of Sardarpur, Shivpuri and Sheopur and special efforts should be made to organize primary societies in such districts where communications are difficult and unsatisfactory and the hamlets are small. In Sardarpur the Bhils and Bhilalas are exposed to serious exploitation by money-lenders and grain-dealers, and the Government should not only start co-operative societies for these tribal groups but manage these on their behalf for their economic amelioration.

In spite of the large number of societies, the co-operative movement has not yet taken roots in the State. Of the total number of societies as many as two-thirds come in classes 'D' and 'E', i.e. their working cannot be regarded as satisfactory. Less than one per cent have been classed as 'A' and adding those in class 'B', the total of those

WEAKNESS OF THE CO-OPERATIVE MOVEMENT

TOTAL NO. OF
SOCIETIES 600

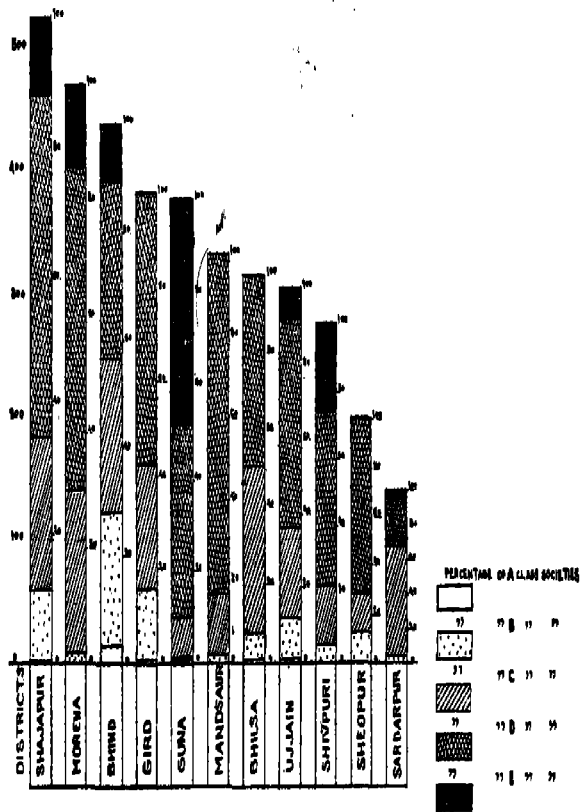


DIAGRAM XV

PREPARED BY
SHYAM NARAYAN DRUPTMAN



that may be considered good is less than even 10 per cent. Of the total working capital of Rs. 53 lakhs, about Rs. 30 lakhs represent loans. An average society has a membership of 18 persons, with a working capital of about Rs. 73 only per member. A Society is not generally permitted to admit more than 50 members ; and while the maximum

TABLE XXXIV
Classification of Societies

District	Total Nos of Societies	Percentage of Societies Classed				
		A	B	C	D	E
1. Gird	383	0.47	15.09	26.88	57.54	..
2. Bhind	439	3.20	26.28	29.80	34.29	6.41
3. Morena	471	..	2.10	28.9	55.04	13.8
4. Sheopur	199	..	11.2	15.7	73.03	..
5. Shivpuri	277	..	5.29	17.8	59.9	25.8
6. Bhilsa	317	0.64	7.3	43.2	48.7	..
7. Ujjain	306	0.32	11.4	24.8	55.5	7.8
8. Shajapur	524	0.19	10.9	23.5	52.8	12.4
9. Mandsaur	334	..	2.1	14.9	82.9	..
10. Guna	380	0.53	5.3	9.1	41.9	47.9
11. Sardarpur	140	..	4.7	64.7	25.7	4.9
Total	3,770	0.57	9.5	26.3	53.4	9.9

has rarely been exceeded, instances are not lacking when 'Societies have been allowed to remain on the register though the number of their members has gone down below 10 for several years'. The proportion of bad and doubtful debts is as high as 38.9 in Bhilsa, 29.11 in Sheopur, 27.67 in Shajapur, 22.67 in Gird and 21.39 in Mandsaur. Likewise, the percentage of unauthorized arrears is very high, being 94.07 in Morena, 80.89 in Sardarpur, 50.37 in Shivpuri, and so on. In the course of a single year, out of a total demand of nearly Rs. 36 lakhs, more than Rs. 30 lakhs were classed as arrears. The classification of bad and doubtful debts is given below :¹

1. Note.—Figures have been taken from the Annual Report on the working of Co-operative Societies and Banks in the Gwalior State for the year 1941 and 1942, Samvat 1998.

TABLE XXXV
Classification of Debts

Serial No.	District	Total No. of Agricultural Credit Societies	Percentage of bad and doubtful Debts
1.	Gird	383	22.6
2.	Bhind	439	5.2
3.	Morena	471	13.1
4.	Sheopur	199	29.1
5.	Shivpuri	277	8.2
6.	Bhilsa	317	38.0
7.	Ujjain	306	7.9
8.	Shajapur	524	27.6
9.	Mandsaur	334	21.3
10.	Guna	380	17.5
11.	Sardarpur	140	9.7
	Total	3,770	18.2

This deterioration and stagnation of the co-operative credit movement is discernible in spite of two important provisions in the organization of the Co-operative Societies, relating to (1) speedy recovery of the dues of a Co-operative Society through Government Inspectors, and (2) special provision of security for the loans granted by a Co-operative Society to its members. The Co-operative Societies Act, Gwalior, empowers the Government Inspectors of Co-operative Societies to adopt summary procedure for the direct attachment of members' movable and immovable property and the sale of the same either by themselves or through Tahsildars. The Act also provides that all the property, belonging to a member and recorded in Asset Register, is to be regarded as mortgaged to the Society, simply on a declaration made by him and even without a formal mortgage. But even these safeguards have failed to give strength to the movement.

A Co-operative Movement which aims at strengthening the economic position of the weak by association with the strong will be untrue to itself if it seeks to eliminate the weak from its protection and that too in such a drastic manner. Likewise a policy of preferential treatment of

large-scale cultivators and persons with large incomes by transferring their debts from the primary Societies to the Banks, and reducing their rate of interest and thus eliminating the more solvent class from the Societies, as envisaged in Scheme No. 61, may lead the Societies to still greater deterioration and to bankruptcy, as it is opposed to the very spirit of co-operation. With regard to the cultivators who have now become insolvent and are likely to be so without adequate means of life, efforts should be made not to oust but to rehabilitate them and restore them to the care of the Co-operative Movement. The extent of relief to such distressed farmers can only be gauged by a careful economic investigation of the repaying capacity and the value of land of each member of the Society, which will be preliminary to assessment of the repaying capacity of the Societies and the assets of the Central Banks. It is note-worthy that though many Provinces and States of India have found that a not inconsiderable proportion of the debt of members to the Societies is unrealizable, a thorough investigation of agricultural costs and profits, land values and repaying capacity of the cultivator has seldom been undertaken by the Co-operative Departments. Under present conditions agriculture is a sub-marginal occupation, offering no profits for about half the cultivators in most regions of India, where holdings have become uneconomic due to continuous subdivision. It is probable that members of Co-operative Societies are better off than the average cultivator and that those who are now bankrupt will not represent half the farming population. But since the proportion of bankrupt cultivators will be considerable we have to rehabilitate their credit by means of subsidies, and also by scaling down the debts by Debt Settlement Boards to an amount which they can pay in 15 or 20 years on the basis of their actual paying capacity.

While it is certain that we can no longer permit the bankrupt to drag down the well-to-do cultivators to a common doom spelt by the ruin of the Co-operative Movement, it is equally definite that the Government should enable the bankrupt cultivators to make arrangements with

the Co-operative Societies and outside creditors, and afford them facilities for reduction or conversion of old debts regarded as too onerous or unredeemable. The recent debt legislation of the agricultural countries of Europe where the farmers' indebtedness led to the collapse of farms is worthy of serious consideration in this connexion. The Danish Government has in the first instance relieved the farmers by the establishment of Crises Funds for the grant of subsidies to the most distressed farmers in order to put them in a position to pay their mortgage and fiscal charges. Forty-two million crowns were distributed among 1,35,000 farmers, i.e. 67 per cent of all the farmers in the country. Another country in Europe which has paid a direct subsidy to the distressed farmers during the Great Depression is Italy. Short-term loans have here been converted to long-period debts, and the State undertakes to pay a part of the repayment instalments to the extent of $2\frac{1}{2}$ per cent. The State has also granted a contribution towards the payment of interest for loans payable in five annual instalments obtained from agricultural banks.

It is necessary that in order to reduce the cramping effect of the cumulative burden of debt on agriculture, the dearth of credit and the slump in agricultural prices that is likely to follow in the post-War period, the Government should find money for the creation of a Rehabilitation Fund like that of Denmark to lighten the burden of mortgage debt and of interest and rent payable by indebted cultivators, to be distributed among the latter according to determined principles. Secondly, the Danish Government has by law facilitated the conversion to loans at a lower rate of interest of the loans granted by the mortgage credit companies. The application of the Danish and Italian precedents to Gwalior conditions may be as follows :

The Government after reducing the claims of Co-operative Societies and outside creditors by a certain percentage by the practical considerations of the repaying capacity of the cultivator and of the probable fall of agricultural prices that should call for revision of all contractual obligations in the post-War period, will contribute a portion of the re-

payment instalments. The Government will also grant loans covering the remainder of the liability to the bankrupt cultivators on the basis of mortgage of their holdings to the State on these lines : freedom from payments for ten years, and afterwards, payment by instalments, and a rate of interest not exceeding $4\frac{1}{2}$ per cent. The Government will raise money by issuing debentures on the basis of the mortgaged properties. To obtain the loan, the cultivators' debt must exceed the mortgage value of the holding by at least 10 per cent, while the loan itself cannot exceed 25 per cent of the mortgage value of the property and must be guaranteed by a mortgage not exceeding 10 per cent of the value of the property. In lieu of the subsidy and facility of credit offered by the Government it may be insisted upon that in the succession the holding should pass undivided to one person (the preferred heir). The charges burdening the succession (including the mortgage debt) must be met as far as possible out of fortune other than the landed property. No new debt can be incurred without the consent of the Co-operative Society or the land-mortgage bank which has rehabilitated the credit of the cultivator. Loans out of this Rehabilitation Fund will be granted also to Co-operative Societies and private money-lenders in order to enable them to cope with the debt redemption policy.

In Germany, before World War II the scheme of conversion of debts was facilitated by the credit granted by the Bank for German Industrial Securities, and the necessary resources for the relief of indebtedness, amounting to a total of 600 million R. M. were drawn to a large extent from a fund formed by levies imposed on industry. The Reich guaranteed up to 25 per cent of the loan granted under the conditions indicated in the event of the non-payment of the mortgage loans credited in relieving the indebtedness. In Bulgaria where the law has reduced both the amount of interest and the amount of debt of farmers, and exempted from sale the debtor's land up to 5 hectares, the reduction of debts is similarly made up out of an Amortization Fund to which the State assigns the

proceeds of the tax on vocations and the supplementary tax on total income. In Switzerland the Confederation and the Cantons both pay 5 million francs a year as subsidy to an Amortization Fund created for the relief of indebtedness. In this country it is worthy of serious consideration whether such an Amortization Fund could be created out of new taxes on industry and professions, the resources of which could be utilized both for subsidy to distressed farmers and the conversion of debts and repayment to money-lenders who renounce a part of their credit.

A more effective and permanent method of rehabilitating credit for the bankrupt cultivators is to make their cultivation profitable through consolidation of holdings and of croppings and through co-operative or collective farming. Many prejudices have to be overcome, many old customs abjured before we can eliminate the present serious drawbacks of the scattering and fragmentation of holdings. The Government should take practical steps through legislation and otherwise to make agriculture economical for small tenants who now distribute themselves between farming and agricultural labour, and for agricultural partners and hired farm-hands, who are landless but who crowd on to the land for eking out a bare living. The intractable feature of the present agricultural crisis in Gwalior is that probably half the number of holdings, at least in the northern districts, have become uneconomical. The average size of a holding is estimated to be only 2 to 3 bighas in Bhind and Morena. The minimum subsistence holding for the cultivator's family cannot be less than 20 bighas here. Considerable sums of money sent by emigrants or soldiers of the villages are the mainstay of cultivation of undersized holdings. Now demobilization has begun, while the rate of population-increase has tended to accelerate the increasing proportion of uneconomic holdings through fragmentation.

Small tenants in undersized holdings are hardly occupied for more than 200 days in the year. Intensive farming is the only method available for the masses of people for the improvement of income and credit. But intensive farming is being jeopardized by the excessive fragmenta-

tion of holdings—which more than any other single factor is responsible for the poverty of debt-ridden cultivators ; and by the deterioration of soil fertility and animal power through the abolition of the practices of fodder cultivation and fallowing which formerly aided nitrogen fixation in the soil. There is no possibility of rehabilitating intensive farming except by overcoming the handicap of subdivision of holdings by either consolidation of holdings or consolidation on the basis of crops. The village will have to be divided according to the crops cultivated and each cultivator will be given, say, two compact blocks, one in the low-lying rice land and the other in the relatively high land which grows rabi. This will ensure both security and the economic advantage of compact farming. In the tube-well region in the U.P. and in other areas as well, consolidation of cropping converts the appearance of the village area to that of a single farm consisting of fields of cane, wheat and other crops instead of the chess-board appearance of the land of most villages. The individual still owns his particular portion of any one block and he may still farm it as a separate unit ; but close association of persons growing the same crop invariably leads to co-operative work on the block as a whole ; it makes the utilization of co-operatively owned implements easier, and it facilitates the demonstration of improvement and stimulates rivalry for better production.

Consolidation of cropping is easier than consolidation of holdings by Co-operative Societies, though the latter has achieved remarkable success in the Punjab, where there are now about 700 Co-operative Consolidation Societies, and the area consolidated from 1921 to 1937 was about 8 lakh acres. In the U. P. there are now about 130 Co-operative Societies and the total area consolidated so far is about 56,000 bighas. The Punjab has deputed one Assistant Registrar and 15 Inspectors of Co-operative Societies and 180 Sub-Inspectors to this phase of the co-operative movement.

To facilitate credit for the mass of small tenants who have now sunk below the credit line it is essential to im-

prove the scale of farming as the basis of credit by means of consolidation. It is probable that due to the fact that the majority of holdings have reached an uneconomical size, the problem can only be solved by legislation, making it compulsory for the cultivators to accept re-stripment when the cultivators of more than, say, one-third of the cultivated area of the village agree to consolidation. Co-operative and Collective Farming Societies should also be organized which should pool bullocks, ploughs and seeds, and undertake agricultural operations in common. It has been the practice of small cultivators in Gwalior to borrow seeds and bullocks from among themselves when they cannot obtain credit from the money-lender. As the latter has become shyer and credit has become dearer, the cultivator has curtailed his expenses for the preparation of the land and is getting a lower crop-yield, and here and there land also remains fallow. The situation can be successfully tackled through the establishment of Collective Farming Societies through which the small tenants may organize themselves for joint ownership of cattle, joint cultivation and an equitable sharing of the produce in consolidated holdings according to the quota of labour from each family estimated by some pre-determined form or standard.

Such Collective Farming Societies would be even more necessary for the landless classes. Their total number in Gwalior is more than a lakh. For every non-cultivating proprietor there are about 3 cultivating owners, 12 tenants and 5 agricultural labourers in Gwalior. All debts of 'harawahas' and majdurs extending beyond, say, 3 years should be extinguished. Debt Liquidation Societies should be established for this purpose. Success in debt liquidation cannot be achieved without special legislation making it penal to keep bond-servants or serfs.

Public opinion should be so focussed and mobilized on this problem that all landlords and tenants declare on a fixed day that they set free all their bond-servants as was done for the Dublas in Bombay. Agricultural wages paid in kind should be standardized, with perhaps a minimum wage fixed at the equivalent of 10 as. per diem. It will

be necessary also for Government to reorganize the Colonization Department and make it as effective as in Italy and the U.S.A. for opening out new lands in Guna, Sheopur, or Sardarpur for colonization by the landless classes. Co-operative reclamation and settlement societies in the uncultivated wastes under the supervision of Government will be helpful. The experience of the co-operative colonization scheme at Gosaba in the Sundarbans should have its lessons for Gwalior. Finally, Collective Farming Societies should be established in newly occupied chaks and blocks and these would obtain land on tenant lease from the zamindars and parcel it out among the landless classes for their joint cultivation. As regards planned co-operation, the reorganization of primary societies is impossible without rehabilitating many members who have now lost solvency and this necessitates organization of collective farming on a wide scale for bringing the latter up to the line of normal credit.

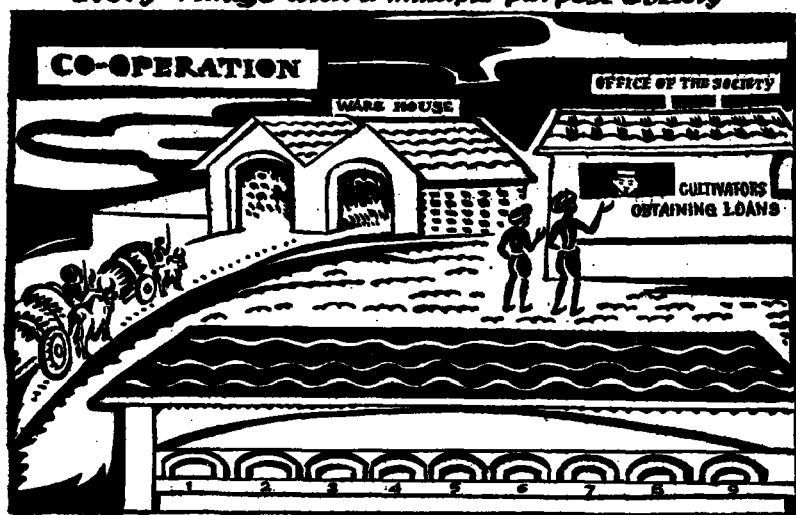
Planning is essential not merely for the rehabilitation of the bankrupt societies, for their integration into improved societies, and for reorganizing the arrangement and agencies for short-term and long-term credit, but also for what is even more essential—relating the Co-operative Movement to the improvement of crop practice, crop marketing, and rural reconstruction generally.

As long as the Co-operative Movement does not link itself with the entire range of methods and agencies for the improvement of income and credit-worthiness of the cultivator, it cannot be rescued from the mire of bankruptcy and the rut of business inefficiency into which it has fallen.

Throughout India, and not merely in Gwalior alone, the Co-operative Movement treats a cultivator's business as a congress of distinct and independent operations to which the principle of 'one thing at a time' is applicable and then starts at the wrong end. Credit cannot be organized on sound lines unless those for whom it is meant are made credit-worthy. So long as farming is left in the vortex of a sub-marginal deficit economy, any attempt at orga-

nized credit will fail in its objective. What is needed is the rise of the entire rural economy to a higher tempo or scale, where small farming may be rationalized to be economic, and the village industries may pulsate with activity, filling the idle or semi-idle hours and days of the population. A Co-operative Society, if it is to be useful and successful, should therefore comprehend the whole of the village life and include every one in the village, it should hum with constant and continuous activity. In other words,

Every-village with a multiple purpose Society



- ① PURCHASE OF PLOUGH, BULLOCKS & IMPLEMENTS. ② CREDIT. ③ SALE.
 ④ CONSOLIDATION OF HOLDINGS. ⑤ BETTER LIVING. ⑥ ADULT EDUCATION.
 ⑦ EROSION CONTROL. ⑧ JUNGLE CLEARANCE. ⑨ PROTECTION AGAINST WILD ANIMALS.

instead of a single-purpose society dealing with credit, it ought to be a multi-purpose society with limited liability for each village in the State. It should be backed by legislation prohibiting cultivators from utilizing the sale-proceeds of their produce without first paying off the Societies' debts, subject of course to the prior claims of land revenue and rent. The English Agricultural Credits Act, 1928, includes a provision making it illegal for members to dispose of the crops before meeting the dues of the Co-operative Societies. In view of the assistance which cultivators

and Primary Societies will obtain from the public exchequer the cultivators cannot reasonably object to their being compelled to dispose of crops only through the Co-operative Sales Societies. In several agricultural countries in Europe crop finance or short-term credit from season to season is given on the basis of the bank or Co-operative Society getting a lien on the crop, and warrants, backed by agricultural produce, have currency as simple commercial bills. In Egypt the agricultural credit establishment of the Government grants loans in cash, or in kind in the form of seeds and fertilisers, such loans being secured on the crops themselves. Crops are sold through the agency of this establishment. During our visits to the Co-operative Societies in the villages of France we were delightfully surprised to find that hardly any crop worth anything is bought and sold privately, such being the hold of the co-operative organization on the farmer's life. In Hungary the form of advances is known as 'green credit', i.e. credit granted against standing crops. In South Africa the law lays down that where in any area 75 per cent of the producers are co-operatively organized and handle 75 per cent of the product, the Minister may, at the request of such organization, prescribe that all producers of that agricultural product within that area shall sell their product through the Co-operative Society or Company. In India the percentage should be brought down, as in the case of compulsory re-stripment and consolidation, to a much lower figure, say 33 per cent of the producers, who may force upon the rest marketing through the co-operative sales organization. It will be expedient to run the marketing side of the Co-operative Society on a limited liability basis, introducing not merely well-to-do cultivators but also sowcars and money-lenders who have so far fought shy of Co-operative Societies because of the principle of unlimited liability. It will be to the interest of the bania when co-operative marketing is forced on the village to build a warehouse or godown which may earn some rent from the Co-operative Society. On the other hand, the Co-operative Society will gain from the sowcars both experience and investment of share capital.

Some societies in the U.P. combine both the principles of limited and unlimited liability for different functions. In the rectification and reorganization programme we should not make a fetish of the unlimited liability principle as we did in the past, but should organize the multiple-purpose Society on the limited liability principle, retaining unlimited liability for the credit side of the business of the society.

In a system of organized warehouses where the cultivators' crops may be stored from season to season the Co-operative Society will lend money against warehouse receipts, and the banias who are members of the Society may materially help the successful working of the warehouses owing to their long and intimate connexion with the grain markets of the country.

It should not, however, be forgotten that a multi-purpose society with comprehensive and varied functions cannot be managed efficiently by the illiterate masses in the villages. The villages in the State, due to their smallness, afford an ideal field for the organization of such societies, but the fact that seldom any one among the inhabitants can read and write or keep accounts properly adds almost insuperable difficulties to their functioning. At present a village society is managed by an outside paid secretary, who on an average looks after 10 to 20 societies. He too can seldom keep accounts properly. In the organization of multi-purpose societies not only will there be need for a large number of trained personnel to provide a secretary for each such society, but the movement will defeat its own object unless illiteracy is liquidated. Hence schemes for both rural education and training of the personnel of the co-operative movement should receive the highest priorities. Schemes Nos. 57, 58, and 59 deserve very early attention of Government.

Considering these limitations, progress towards the organization of multi-purpose societies should be only gradual ; and instead of a rapid movement throughout the State, beginnings should be made in selected areas, accelerating the speed of organization from year to year as more trained staff becomes available, until the target of a

society for each village is reached. Similarly in their functioning aspects, the new type of societies, instead of being burdened with all their varied functions from the beginning should start with the simpler and less risky functions, enlarging their scope gradually as they gain experience. To illustrate, they may first take up the functions usually assigned to a 'better living society', and then take up marketing, supply, credit, consolidation, farming, processing, and so on.

The existing credit societies should also be turned gradually into multi-purpose societies. These had better begin by combining marketing with their present business. It may be made obligatory on the part of members to sell their produce through their societies, while the Government may help the movement by purchasing stocks from the societies by grant of preferences of a monopolistic nature in their procurement schemes or premiums for better quality of the produce. Co-operative sale may then lead to co-operative purchase of improved seeds, raw materials, implements and manures, etc. It should then, like the other societies starting with better living, take up consolidation, farming, processing, production, etc.

In any case, however, a check should be put to the organization of new single-purpose credit societies. Among those which already exist all are not capable of rehabilitation and reorganization as suggested above. A great many of them should be subjected to a severe process of rectification and elimination of the dead wood. It may be necessary to liquidate a number of them.

For the finance of the village co-operative societies there are District and Pargana Banks, functioning under the Banks Act of 1925. These banks advance loans direct to individuals as well. Their working capital consists largely of deposits of which nearly two-thirds or Rs. 28 lakhs have been given by the Government. Strictly speaking, this state of affairs is not very satisfactory, and although Government deposits have been very liberal and generous, the policy has meant too much spoon-feeding, providing little or no incentive to the banks to attract local deposits or to

be self-reliant. In addition these banks have shown year after year large idle surpluses, which points to the imperative need of expanding their business.

These Central Banks should conduct their business in a way that would lead to strengthening their most important clients, viz. the village co-operative societies. They should, therefore, take a due part in the organized marketing of village produce and distribution and supply of seeds, raw materials, implements, etc. A very small beginning in the direction has already been made by the Central Bank at Guna. For orderly development of such business, warehouse and godown facilities should be immediately developed. Each Central Bank should construct a godown either out of its own funds or out of a loan advanced by Government, to stock produce of its clients, and improved seed and other stocks for distribution. It should grant credit on the basis of these stocks and give other warehouse facilities. Scheme No. 60 which envisages such construction of godowns in the market towns of Gwalior should be implemented at an early date. Consumers' Stores may also be developed and the Central Banks should act as links between the village Co-operatives and urban Stores for the exchange of goods. To eliminate the risks incidental to seasonal price fluctuations, the Central Banks should act merely as agents rather than undertake stocking, selling and purchasing in their own behalf. The latter should be left to the ordinary channels of trade through regulated and organized mandis whose facilities, working and administration should be improved as suggested in Scheme No. 26.

But without an apex bank at the centre the co-operative structure can hardly be complete. The Government have already under consideration a scheme for the establishment of the Gwalior Co-operative Apex Bank to be started with a capital of Rs. 5 lakhs. We endorse Scheme No. 62 as essential for the integration and expansion of the co-operative movement in the State. An apex bank is needed in the State not only for co-ordinating the finances of the Central Banks and to act as financing agencies for them, but also to organize mortgage credit on sound lines. This Bank

should, therefore, be constituted without further delay with two main departments, viz. a banking department concerned with the finance of the Central Banks and an issue department for the issue of debentures for mortgage credit as explained below.

The ordinary Co-operative Societies are not in a position to meet the long-term credit requirements of the cultivators, which can best be met by an agency that is in a position to grant relatively larger amounts as loans on the security of rights in land, with facilities for repayment in easy instalments spread over a long period. Land-mortgage banking can best fill this requirement and give a fillip to schemes of agricultural improvement. Co-operative Land Mortgage Banks should, therefore, be constituted in each district under an Act as in the provinces of Bombay and Madras with the Co-operative Apex Bank acting in its issue department as the central agency for the issue of debentures, the principal and interest on which should be guaranteed fully and unconditionally by the Government, which should also follow a liberal policy in investing its own funds in them. The Government have already sanctioned a sum of Rs. 25 lakhs for agricultural credit as mentioned in Scheme No. 43. A large part of this should be set apart for investment in these land-mortgage debentures and the remainder could be well utilized by direct loans to agriculturists for permanent land improvements such as trenching, terracing, counter-trenching and drainage.

To sum up, our targets ought to be : 1. Redemption of debt owed by every member of a co-operative society to outside creditors.

2. Establishment of a multi-purpose co-operative society in each village, which may bring about better farming, better industry, and better living.

3. Rectification and elimination of the insolvent and weak credit societies and expansion of functions of the rest so as to include marketing and other forms of co-operation.

4. Establishment of a Co-operative Apex Bank with the banking and issue departments.

5. Development of co-operative land mortgage bank-

ing with a central agency in the Apex Bank for the issue of debentures.

Co-operative organization on the above lines may start with simple-looking things like better living and farming, but will bring on the completion of the plan a complete co-operative village economy humming with scientific farming and progressive cottage industries. It will bring in its train co-operative farms with modern equipment and re-organization of village industries on modern lines.

Co-operation has so far been an exotic movement which is not assimilated to the indigenous social and economic structure of the village. Planned co-operation implies not merely co-operative finance and marketing of crops but also, and what is more, co-operation in cultivation and irrigation, in the clearance of jungle and improvement of rural industries and communications—rural reconstruction in the wider sense of the term. And the effective agency of such community co-operation cannot be Government inspection and inspectors but the time-honoured organ of village self-government, the Panchayat of the village elders. More than the bankruptcy of Co-operative Societies and Central Banks, the failure of co-operation is proclaimed by the fact that co-operation has not been able to assimilate itself to the ancient indigenous means of social control, viz. the Panchayat, and that a fresh movement, viz. the rural reconstruction drive, has had to be undertaken for the uplift of the villager. The time has come when there should be frank recognition of the fact that whether we think of rural reconstruction or of co-operative rehabilitation—and we can never think of the one without the other—India's ancient and essential organ of economic management and social government must be utilized and inspired. No developmental activities of the Government or of any non-official social service organization could bear lasting fruits unless these are accepted as part of the ordinary routine of life by the Panchayat and led into a unified channel by it. It is note-worthy that in China a hierarchy of family, village and town councils is systematically utilized for rural reconstruction with its four-fold programme

of government, education, development and defence. Pao, Hsiang and Hsien councils have played an important role in the multiplication of schools, recruitment and defence under the system of local government revived by Generalissimo Chiang.

But it is even more necessary today to develop other means of social control. For securing co-ordination and efficiency, we should have Unions of Co-operative Societies, Central Banks and Warehouses dealing with a homogeneous group of villages. Thus the Panchayat, which should be the nucleus of developmental activity for agriculture, co-operation and sanitation of the isolated village, should be linked with, or expand into, central institutions and agencies. The efficiency of the rural movement in India would thus depend not merely on the capacity of the Panchayat to renew ancient village solidarity and economic authority and management but also on the ease with which Union Panchayats or Boards could implant themselves and transfer the foundations of social planning from Government initiative and guidance to the firmer basis of rural public opinion. The corporate life of the rural masses is to be revived not only in the village but also in groups of villages. And, indeed, it is the absence of strong intermediary bodies between the district authorities and the organs of the village, whether Co-operative Societies, schools or village Panchayats, which had stood in the way of that co-ordination, and integration without which developmental activities would be too costly and unduly dependent upon inspection and inspectors. The intermediary bodies, uniting, co-ordinating, and directing the activities of the village will be different and their circles of jurisdiction will extend according to their types of activity. The success of Japan in modernizing and mechanizing the village and improving its culture, self-government and general tenor of life is very largely due to the organization of various kinds of intermediary bodies that form essential links between Government developmental activity and village life. Each large village in Gwalior is expected to have its own Panchayat, Co-operative Society, Seed Store, and Primary School. But as peasant life deve-

lops and expands, a Middle or High School will cater to the needs of, say, fifteen villages, reacting powerfully on the efficiency of the Primary Schools and the removal of illiteracy. With Co-operative Societies multiplying, the Union of Primary Societies and the Central Bank will be necessary to integrate and supervise credit operations, and this would embrace fifteen to twenty villages. Similarly as Sales Societies crop up in the countryside, a Co-operative Marketing Board will inevitably emerge and this will maintain and develop standards of better farming, business, and living. In the countryside as Seed Stores are established and improved crops and methods are demanded, a Model Agricultural Farm will similarly be set up as the centre of field demonstrations and agricultural propaganda, distribution of improved agricultural implements and machinery and breeding-bulls for the area. Union Panchayats and Boards will supervise the work of the village Panchayats, and initiate all those activities which could not be taken up as yet by any special functional bodies and agencies. It is thus through methods of concentration and co-ordination that the entire range of activities coming under rural reconstruction can be successfully directed and integrated. That is essentially the meaning of rural planning.

As the standards of rural living and business improve, different agencies of rural uplift will develop ; and this both in the single village as well as in the circles or groups of villages which become broader units of economic attack. On the other hand, activities in the different fields of agriculture, co-operation, sanitation, education and so on act and react upon one another.

Agriculture prospers through improvement of credit and marketing facilities by co-operation and of the technique of manuring, irrigation and farming practice by agricultural field demonstrations. The advantages of cheap credit are nullified if farming be inefficient or if farmers waste money over social expenditure and litigation, or become victims of malaria seasonally and recurrently. Organized marketing fails if the farmers do not select their seeds nor consolidate their cropping and holdings. One of the strik-

ing instances of linking agricultural, marketing and credit improvements together is afforded by the Cane Growers' Co-operative Societies in the U.P. and Bihar. Under the Cane Development Scheme of the U.P., the Co-operative Societies supplied 8.34 crore maunds of cane to the factories ; about 19 lakh maunds of seed of new varieties, 80 thousand maunds of the various fertilizer mixtures, and 4 thousand improved implements were distributed. The Co-operative Societies have also proved most successful in financing the cane growers, who have shown hardly any outstanding arrears. In Bihar progress in these directions has not been so striking ; but an all-sided programme, including improvement of seed manuring and agricultural implements, construction of roads, marketing and the building up of 'a common-good fund' has been kept in view. All this is a heartening example of crop-planning, finance and marketing combined in the same co-operative agency. But even such a concerted offensive has touched only the fringe of agriculture. All the major crops and not merely the cash crops should be brought under the scope of the Co-operative Multiple-Purpose Society for agricultural production, credit and marketing. Co-operative education should also embrace social reform. The excessive burden of uneconomical and superfluous cattle on tiny holdings is today a most serious handicap of small farming. No benefits from the improvement of food supply or distribution of good breeding-bulls can accrue nor co-operative dairying succeed if farmers do not get rid of the present partiality for the maintenance of useless, superfluous beasts. Again, the social and economic aims of co-operation are vitiated if the peasantry multiply without restraint, outreaching not merely the out-turns of their fields but also the facilities of education and sanitation that may be provided. Thus planned co-operation must be an offensive on all fronts. Weakness or indefensibility in one sector will establish the foe in no time within the entire territory. The peasant's life with its inefficiency, simplicity, fear and ignorance is one undivided whole, and only that rural programme succeeds which can improve him from all sides, economically, social-

ly and morally. He cannot be progress-minded in one direction and conservative and superstitious in another.

Finally, the vast ignorance and colossal helplessness of the rural masses imply that a co-operative programme cannot succeed if we do not send out into the countryside groups of itinerant workers—whether peripatetic teachers, co-operators, or medical men—with a social message. In China the Ting-Hsien experiment begun in 1934 has obtained phenomenal success in the liquidation of rural illiteracy and the rural reconstruction movement has been the outgrowth of the mass education movement. It is the idealism and sacrifice of the younger generation of the intelligentsia which can best prepare the younger generation of peasants for an intelligent adjustment to the complex social and economic situation that now confronts them.

CHAPTER XI

REFORM OF TENANCY

Agricultural progress depends to a very large extent on land policy. No advance towards scientific farming and animal husbandry is possible without assuring the cultivators stability of tenure and fixation and enforcement of fair rents. The law at present recognizes four main classes of tenants, viz. ex-proprietory, occupancy, non-occupancy and sub-tenants. Both the ex-proprietory and occupancy tenants have permanent and heritable rights, which are also transferable in the case of the former and of the Pukhta Maurusi or full occupancy tenants. But the non-occupancy tenants and the sub-tenants have no protection.

In the ryotwari villages, since at the time of settlement occupancy status is recognized for all except the sub-tenants the problem is not one of assuring stability of tenure. But in the zamindari areas there can be little agricultural stabilization, as a considerable portion of land is cultivated by the unprotected non-occupancy tenants and sub-tenants. A few village surveys undertaken in August 1945 reveal that half to two-thirds of the area in the zamindari villages is cultivated by the non-occupancy tenants. The following figures are significant :

TABLE XXXVI
Proportion of Occupancy and Non-occupancy Tenants as revealed by village surveys

Village	Number of Tenants		Area in bighas Cultivated by—	
	Occupancy	Non-occupancy	Occupancy tenants	Non-occupancy tenants
Gung	241	156	947	1193
Mahur	99	77	1715	1568
Barkheri Gird	91	104	1265	1870
Mahur	24	18	166	677
Semra	33	13	434	559
Behta Jhir	13	45	94	925
Barkhera Dhakeni	23	18	383	353
Jhagar	..	..	1016	1797
Gader	..	..	91	106

TABLE XXXVII

Cultivated Area according to Tenures
(in bighas)

Serial No.	Village	District	Khudkasht		Occupancy		Non-occupancy		Others	
			Bgh.	Bis.	Bgh.	Bis.	Bgh.	Bis.	Bgh.	Bis.
1.	Daulatpur	Ujjain	318	12	780	4	518	8	16	1
2.	Ingoria	"	345	6	3,315	12	423	4	1,610	3
3.	Deo-ki-Khajuri	Bhilsa	1,097	13	1,951	15	929	13	516	6
4.	Masoodpur	"	327	11	560	18	423	4	64	12
5.	Sawan	Mandsaur	2,870	1	1,132	15	3,929	1	1,271	19
6.	Ratangarh	"	107	0	48	0	304	8	66	14
7.	Dhundarka	"	301	19	4,401	10	748	7	993	8
8.	Kanat	Shajapur	..	..	3,480	10	1,469	10	4,453	9
9.	Magrola	"	205	0	3,041	16	2,194	7	126	10
10.	Satanwara Kalan	Shivpuri	569	13	537	13	482	2	91	8
11.	Lukwasa	"	2,491	3	1,390	7	3,232	1	88	17
12.	Mangrol	Morena	388	15	2,443	10	876	17	78	4
13.	Bilgoan Chowdhary	"	956	17	2,421	0	819	0	300	0
14.	Nurabad	"	511	0	715	0	320	2	424	2
15.	Pandola	Sheopur	..	..	2,587	13	3,149	18	160	15
16.	Garhi	"	108	0	737	7	118	10	194	10
17.	Antri	Gird	294	3	2,001	11	3,729	17	1,128	4
18.	Purani Chhawni	"	71	3	324	10	302	11	144	4
19.	Penchi	Guna	404	9	536	10	261	18	30	17
20.	Ramsar	"	86	4	1,312	19	1,988	16	320	0
Total			11,422	14	33,747	7	26,220	4	12,080	1
Percentage of Total Cultivated Area			13.5		40.5		31.5		14.5	

Mr H. M. Bull's surveys of 20 villages show the following distribution of the cultivated area according to tenures :

Percentage Distribution of Cultivated area :

Khudkasht .. 13.6 ; Occupancy .. 40.5 ;
Non-occupancy .. 31.5 ; Others .. 14.4 ;

In 35 villages chosen by random sampling from the Director of Agriculture's all-State survey, the distribution of Maurusi rights and the average rent per bigha are as follows :

TABLE XXXVIII

Serial No.	Village	District	Percentage of the Maurusi area to the total cultivated area	Average rent per bigha Rs. As. Ps.		
1.	Khanpura	Gird	66	—		
2.	Amayan	Bhind	52	—		
3.	Kathoda	"	89	1	13	10
4.	Chhan	"	21	2	6	0
5.	Atalpur	Shivpuri	42	1	8	0
6.	Isri	"	1.3	1	0	0
7.	Khidraoni	"	24	1	0	0
8.	Toda-Pichhore	"	14	—		
9.	Narya-Kheri	"	50	—		
10.	Siroha	"	75	—		
11.	Garha	"	24	1	0	0
12.	Korua-Kheri	Guna	20	1	2	0
13.	Jhore-da	"	4	1	3	3
14.	Bhora	"	48	1	0	0
15.	Kariya-Bichhu	"	18	1	0	0
16.	Samari-Shahabad	"	50	1	4	0
17.	Suba-Kheri	Bhilsa	25	1	13	0
18.	Madhia-Samera	"	51	1	9	0
19.	Bhorua	"	83	0	14	0
20.	Kanda	Sardarpur	64	—		
21.	Hirpur-Bajja	Shajapur	92	1	6	2
22.	Godhna	"	58	1	8	10
23.	Lodha-Kheri	"	96	0	13	0
24.	Majishpur	"	60	—		
25.	Guradi	"	71	1	4	10
26.	Jawad	Mandsaur	4.9	—		
27.	Palri	"	85	2	8	0
28.	Isah-Kheri	"	51	1	8	0
29.	Devri	"	76	—		
30.	Gangapur	"	23	2	9	0
31.	Harnaveda	Ujjain	22	1	9	9
32.	Kalyanpura	"	25	2	6	3
33.	Gazi-Kheri	"	96	1	3	8
34.	Nuna-Kheri	"	16	1	14	0
35.	Maru-Kheri	"	56	3	0	0

The non-occupancy tenants are obviously not as much interested in their holdings or their permanent improvements as the protected ones are. They exhibit a lower standard of farming and husbandry, with little incentive to take initiative in improvements or to invest capital in land. The non-occupancy status sometimes acts as a direct handicap on improvements even when the cultivator is enterprising, e.g. in the extension of well-irrigation—for, since construction of wells leads to the attainment of occupancy rights, zamindars seldom, if ever, look on such enterprise with equanimity. The Darbar recognized these dangers as far back as 1925 and stated its policy as follows : 'This insecurity of tenure naturally begets lack of interest in the cultivators in the improvement of their holdings. This constitutes also one of the causes of poor production....I think the best solution of this question would be to preclude the Zamindar from ejecting a tenant at his sweet will on the one hand and to repeal the existing time-clause in the law about occupancy rights, on the other.' Reliance has been placed on prescription of 12 years' continuous cultivation and the grant of such right by zamindars for the accrual of occupancy rights. But the zamindars seldom permit the growth of these rights, particularly in densely populated districts where the demand for land is acute, in order to take full advantage of the higher and increasing rent that they can manage to get from the non-occupancy tenants. In the Bhind district where there is a good deal of competition for land, the non-occupancy tenants in a village surveyed pay as much as Rs. 11-8 as rent as compared with Rs. 3-3 to Rs. 5 paid by occupancy tenants. To minimize the chances of the accrual of occupancy rights the zamindars go on constantly changing their non-occupancy tenants. Even in a district like Guna, where rural density is only 104 per sq. mile and land shortage is not acute, of the 444 non-occupancy tenants in nine¹ typical villages which were surveyed, 164 or about 37 per cent

1. Their names are : (1) Guna, (2) Umaria, (3) Mahur, (4) Barkhera Dhakeni, (5) Barkhera Gird, (6) Semra, (7) Behta Jhir, (8) Jhir, and (9) Mahur.

were not of more than four years' standing—of whom again, as many as one-third were on their holdings only for one year. Only some 72 of these 444 non-occupancy tenants, i. e. less than one-sixth had been able to enjoy continuous possession of their holdings for nine or more years. This high turn-over is one of the most important causes of agricultural inefficiency, stagnation, lack of improvements, poor yields, rack-renting and poverty. To remedy the situation no time should be lost in granting hereditary rights to the non-occupancy tenants in the zamindari areas, by a wise stroke of the pen as the late His Highness envisaged.

A progressive land policy, however, should not merely rest with a guarantee of stability of tenure. It should further safeguard conditions for the solvency and stability of cultivators. Consequently, there should be freedom from arbitrary and frequent enhancements of rents, which should be so determined as to be fair for each class of tenants. This will necessitate legal provision for a scientific determination and enforcement of economic rates through specially appointed rent-rate officers. These officers should try to determine such rents, which represent a true surplus over and above the expenses of production, after taking into full consideration the cost of family labour. These rates should be revised periodically, say after 30 years, in each district. To guard against any violent fluctuation in prices a sliding scale may be adopted so that rents may automatically be adjusted to changes in the price level.

The rules about rent-realization also need considerable improvements. The present rule about the distraint of crops and civil arrest of a defaulter should be abrogated, for such procedure usually results in the dissipation of produce or withdrawal of the cultivator at a time when his services are needed most. It may even cause further defaults. The best course would be to make provision for the auction or transfer of the rights of a defaulting tenant through the revenue courts in execution of a decree for arrears of rent.

An unlimited right to sublet is always an evil of high

magnitude, resulting as it does in the creation of a class of function-less middlemen and in exploitation of the landless labourers, who as sub-tenants show a very poor standard of farming. The practice of sub-letting is already doing considerable harm. During a recent tour it was observed that in one village,¹ which by no means appeared to be exceptional, the area cultivated by the sub-tenants was as high as 114 bighas in comparison with 434 bighas of the occupancy tenants. The number of sub-tenants in this village exceeded even the number of non-occupancy tenants. The condition all round may not be so bad, but it can hardly be denied that the protected tenants are abusing their rights by sub-letting considerable areas. Sub-letting should, therefore, be restricted for the period of a year and that too only in an expediency. If a cultivator habitually sub-lets his holding, his rights should be transferred to the sub-tenants.

The right to transfer holdings leads not only to greater indebtedness and reckless expenditure but also causes the non-cultivating money-lender to displace the real cultivators. The ordinary occupancy tenants can transfer holdings with the written consent of the zamindars whereas no such consent is necessary for the full occupancy tenants, i.e. those who have enjoyed their occupancy rights for more than 12 years. In each case the zamindar has right of pre-emption. In the ryotwari villages this right is limited only for cultivation purposes. It is, however, abused in both the areas. Transferability should, therefore, be recognized only for the purpose of organized credit for agricultural improvements through co-operative or State agencies.

Finally, the State should pursue a policy of eliminating the function-less intermediary in the land so that it may be in direct contact with the cultivator and in a position to play an active role in the rationalization of small-scale farming. The holdings at present are too small to admit of scientific farming and the capital resources at the command of these petty cultivators are too inadequate for effecting

1. Semra, District Guna.

TABLE XXXIX

Size of Holdings

Village	District	Average size of holdings of			
		Zamindars	Occupancy tenants	Non-occupancy tenants	All cultivators
		Bgh. Bis.	Bgh. Bis.	Bgh. Bis.	Bgh. Bis.
Satanwara					12 6
Kalan	Shivpuri	30 10	8 16	10 9	(Mauti)
Lukwasa	"	14 1	16 3	21 5	13 0
Mangrol	Morena	77 15	9 17	5 8	2 3
Bilgaon-Chowdhary	"	5 1	12 0	18 0	3 4
Nurabad	"	9 0	8 1	13 7	8 11
Pandola	Sheopur	..	18 4	27 17	8 15
Garhi	"	15 8	4 11	4 1	4 2
Antri	Gird	13 0	10 2	9 11	4 4
Purani-Chhaoni	"	71 3	7 14	4 14	5 8
Penchi	Guna	40 9	5 1	9 14	7 0
Ramsar	"	21 11	33 15	36 16	18 0
Daulatpur	Ujjain	53 2	13 14	24 14	12 0
Ingoria	"	345 6	52 13	47 0	29 0
Deo-ki-Khajuri	Bhilsa	34 6	25 13	12 4	18 0
Masoodpur	"	327 11	11 18	7 6	28 0
Sawan	Mandsaur	14 11	10 3	13 5	34 0
Ratangarh	"	2 12	1 9	2 9	2 10
Dhundarka	"	75 10	20 17	11 0	15 0
Kanad **	Shajapur	..	13 7	27 4	12 0
Magrola	"	205 0	34 12	56 5	23 0
All		75 6	15 19	18 2	13 0

** The Manzabag Rajahwari, there are no zamindars

Bgh.=Bighas

Bis.=Biswas

any improvements. On the whole the average size of a zamindar's holding is very much bigger than that of a tenant's. Mr H. M. Bull's village surveys yield the following conclusions in respect of the average size of holdings of different grades of cultivators :

<i>Average Size of Holding</i>		
	Bighas	Biswas
Zamindars	75	6
Occupancy tenants	15	19
Non-occupancy tenants	18	2
All Cultivators	13	0

It will be more appropriate, however, to scrutinize the proportion of different grades of cultivators cultivating holdings of different sizes. The results of a few village surveys conducted by us in this connexion reveal very small sizes of farming and are given in TABLE XL.

Out of 3,585 holdings 43 per cent are of less than 5 bighas each. Nearly three-fourths of the sub-tenants have 5 bighas or less, whereas only 15 per cent of the cultivators have holdings of 20 bighas or more. The situation is more serious indeed, in the relatively crowded districts such as Bhind, where nearly 75 per cent of the cultivators cultivate less than 5 bighas each and the number of cultivators with more than 15 bighas is only a little more than 7 per cent.

Without some form of combination either through co-operation or collectivization little agricultural improvement is possible under such conditions. The Co-operative Department should organize societies for the consolidation of holdings. The Government should offer facilities for such consolidation by bearing the costs of surveying and restriping and also refuse registration of transfer of holdings below a certain minimum size of, say, 25 bighas—a limit that has been adopted in the case of transfer of Pukhta Maurusi holdings. As a basic step towards such rationalization the State ought to play a more active part in the reorganization of the petty holdings, and as such must abolish or reduce all such intermediaries in the land who have no economic

TABLE XL
Averages for the Districts

Serial No.	Name of the District	Class of tenant	Number of cultivators cultivating					
			Less than 5 Bgh.	5—10 Bgh.	10—15 Bgh.	15—20 Bgh.	20 Bgh. or more	Total
1.	Guna	Occupancy	75	91	30	54	251	501
		Non-occupancy	133	86	43	51	91	404
		Sub-tenant	52	13	14	1	6	86
		Total	260	190	87	106	348	991
2.	Bhind	Occupancy	295	91	57	22	13	482
		Non-occupancy	175	41	15	9	13	253
		Sub-tenant	145	32	3	1	..	181
		Total	615	164	75	32	20	816
3	Shivpuri	Occupancy	324	321	98	69	107	919
		Non-occupancy	229	160	92	55	46	582
		Sub-tenant	130	29	16	4	2	181
		Total	683	510	206	128	155	1,682
	Total	Occupancy	694	503	185	145	371	1,898
		Non-occupancy	537	287	150	115	150	1,239
		Sub-tenant	327	74	33	6	8	448
		Total	1,558	864	368	266	529	3,585
		Percentage	43.4	24	10.3	7.4	14.9	100

functions to perform. It is therefore desirable that the State should adopt a policy of direct collection of all rents even in the zamindari areas, beginning immediately in the case of absentees, handing over to the Malguzars their share of profits after deducting adequately for collection expenses. Gradually these latter may find it in their own interest to relinquish their rights on such terms as may be agreed, facilitating the ultimate adoption of the ryotwari system in the entire khalsa area.

It need hardly to be added that simultaneous land reforms in jagir areas on the above lines will be found equally beneficent and necessary.

CHAPTER XII

LIQUIDATION OF ILLITERACY

In Gwalior State 92 out of 100 persons are illiterate. Only one male in every 8 and one female in every 50 is literate. A systematic effort must now be made for the liquidation of illiteracy by making education free and compulsory in a twenty-year plan. Most villages having a population of 500 and above possess primary schools. Village primary schools number 1,173 today, with 46 students on an average. Out of the total number of 10,569 villages in the State, there are 5,682 villages which either possess a school or are situated within a radius of two miles from a school.

TABLE XLI
Distribution of Schools in Gwalior

Districts	Total No. of villages	Total No. of schools (Primary & Middle)	Villages beyond a distance of 2 miles and above from the nearest school		Percentage of total population in such school-less villages
			Number	Percentage	
Gird	819	246	246	30.0	11.8
Sheopur	515	77	285	55.3	40.0
Bhind	816	305	108	13.2	6.2
Morena	784	306	136	17.3	8.2
Guna	1,908	158	1,119	58.7	50.5
Shivpuri	1,267	184	612	48.3	37.7
Shajapur	1,017	133	590	58.0	47.6
Bhilsa	936	86	604	64.5	53.2
Ujjain	1,083	192	618	57.0	34.6
Mandsaur	879	179	296	33.6	17.5
Sardarpur	574	84	302	52.6	34.5

Accordingly, for 4,467 or roughly 5,000 villages schools have to be provided. The educational aim should be to have a two-teacher school in every school-less village or at least every village which is distant from the nearest school by more than two miles. Boys and girls of the age-

group 6 to 11 should not be required to traverse a distance of more than 2 miles for their schooling.

On this assumption the State should have 250 additional schools each year in a twenty-year plan. The estimated cost would be Rs. 5,00,000 non-recurring for buildings, and Rs. 50,000 recurring for two teachers' salaries in the grade of Rs. 20—1—40. Compulsion will be required so as to ensure universal and regular attendance. The age for compulsory education may be fixed at between 6 to 11 years. Free milk supply should be introduced in all schools with a view to the improvement of the nutrition standard. The cost of catering milk for the requirements of fifty boys for two hundred days in the year will be Rs. 50,000 per annum. The school building will be of the tiled or thatched cottage type, having two rooms with a verandah in front. Adjoining the school building will be a small plot of land for agricultural training and demonstration. The school building will also be utilized for a rural library—the nucleus of an adult education movement.

Adults will be encouraged to listen to story-telling or see films or lantern slides dealing with history, civics, agriculture, economics and other topics touching their daily life. School teachers will obtain a subsidy according to the number of adults they can make literate, while the distribution of books and newspapers from the school library will prevent the adult literates from lapsing into illiteracy.

In a drive towards eradication of mass illiteracy it is essential to build up the structure of education in such a manner as not to engender a distrust of the ancient calling of agriculture and a wish to migrate from the village in the lure of government or other service. Significant movements are now afoot in the country for correcting the present system of book education and relate the school to the problems and tasks of agriculture and village life in India. As a matter of fact, compulsory education disseminating a purely literary type of instruction will do more harm than good.

For a steady development of intelligence and creative enterprise of the masses, it is essential to run schools on

what are called 'Basic Education' lines. The Provincial Governments of Bihar, U.P., C.P. and Orissa and the State of Kashmir have been running quite a number of schools and training schools as an experiment. On the whole, the results have been that the children show greater alertness, quickness and self-expression and acquire habits of co-operative work while social prejudices are also breaking down. The average attendance also shows a marked improvement, especially as the parents find that the children are becoming self-supporting.

It must be stated at once that though spinning was chosen in the first instance as the craft pre-eminently suitable for children of all ages and for the village children in particular in the Basic Scheme of education, it was never contemplated to be the only craft. There was a great dearth of knowledge and of books about crafts other than spinning which on the other hand under efficient instruction has easily contributed towards an appreciable income-gain on the part of the children. It was estimated by the Zakir Husain Committee that in a year of 288 working days with 3 hours and 20 minutes devoted to craft work a child could produce Rs. 2-10 worth in Grade I and Rs. 7 worth in Grade II. The earnings of the basic schools in Bihar have shown that 78 per cent of the pupils in Grade II and 71 per cent in Grade I earned above 50 per cent of the required standard. As a result of the year's working a sum of Rs. 2,112-3-0 was placed in the treasury as price of the yarn spun by the children and the cloth woven out of it, as also of their garden produce. There was in hand also stock worth Rs. 268-3-8. After deducting the cost of raw materials and production, Rs. 1,124-9-9 represented the actual value realized. Later the individual earning touched Rs. 7-3-4. Such earnings of pupils, however, have not been the general rule. The Educational Department of the U. P. Government have rejected the notion of self-supporting schools, but stressed the notion of self-sufficiency, i.e. the raw material required may be supplied by the school itself. Articles made by the children are given back to them so that the homes might profit. Thus if children bring back cloths

to their homes there would be less incentive for their parents to take them away from the school for field labour. In a poor country like India the progress of education can be much quickened if the rural population takes a vivid interest in the handiwork of the children and finds it a source of income in the bargain.

We have already suggested the need of recognition of other crafts and activities besides spinning in the education scheme. Agriculture in a broad sense is the mother of all crafts, vocations and enterprises. Arithmetic and geography can be easily and effectively taught in the background of agricultural operations and practices. In the school farm, physics and chemistry can be introduced in an objective study of the lay-out of the holdings, and of soils and manures. Biology may be introduced into the description of the insect, bird, or animal life in relation to agriculture, or into the selection and breeding of improved varieties of crops and cattle. The practical arts of life in the countryside such as the preparation of the land for the plough, terracing, bunding and drainage, the system of crops, the breeding of animals and the management of the holding—all can be a training for the mind as rigorous as any abstract learning and far less dull or insipid, related as these are to the needs and opportunities of living. If agriculture in India is ever to achieve its due role in planned economy, it certainly requires bold scientific experiments ; but before and above everything else it requires cultural reinstatement of the peasant. The present educational system uproots him from the land. Future education must give him as thorough a technical training as well as general and intellectual enjoyment as the urban classes now enjoy. Thus Agricultural Nature Study must supersede General Knowledge in all schools, and syllabuses and books must be prepared giving lessons from agriculture and rural life. In the United States of America and in Soviet Russia, the entire system of studies is suitably adjusted to various crafts, occupations and agriculture. Scheme No. 72 should be suitably modified to achieve this end in view. Rural schools should everywhere introduce training in arts and crafts that

are established in the region and adapted to its resources. Thus in the case of such forest tribes as the Saharyas, Moghas, Bhils and Minas the school training should suitably include forest-crafts and industries utilizing hides and skins, horns, gums and raisins and other minor forest products as mentioned in Scheme Nos. 116 and 117. For undertaking a programme of education that will sweep over the entire State, it is essential to accelerate training of men and women for the primary, middle and high schools and to produce qualified teachers for subjects requiring special skill as, for instance, agriculture, domestic science, manual training, music, and art. Schemes Nos. 16 and 17 for the establishment of normal schools for training primary and middle school teachers should be suitably enlarged so that these may cater to the urgent needs of educational expansion in the whole State. These schemes require immediate implementing.

The lower primary school devotes itself to the training in the three R's only. The upper primary school needs making a beginning and creating a taste for agriculture and for the crafts and vocations. This should be followed by a diversification of studies so that some groups of pupils may train themselves for technological institutes with a modicum of the humanities, while other groups go up for academic liberal education. Without a good deal of diversification in the secondary school stage, the present bias for literary careers cannot be overcome. The existing educational system should be strengthened and enlarged by provision of various types of institutions for technical education. The problem cannot be dealt with in greater detail here and it should form the subject of a separate comprehensive enquiry and report.

The lower and upper primary and the secondary schools should form the foci of the movement for the abolition of illiteracy. In the first place, teachers of the existing schools should be given subsidies for holding adult classes and teaching adults the three R's. The present practice in Gwalior is to give a bonus to the teacher at the rate of Rs. 2 per adult made literate by him. For the adult

class an additional Rs. 3 would be required for lighting and contingency for a period of about 6 to 8 months. This will be one line of attack of illiteracy.

Another line will be represented by what may be called People's Schools manned by teachers for a special programme of adult education. Here the teachers will not be appointed for schools, but rather certain areas or circuits will be placed in their charge. The teacher of the People's School will proceed from village to village with a slogan such as 'All able to read and write.' Attendance will be compulsory for adults as long as they cannot pass a simple test for reading and writing. In Turkey, where intensive efforts to wipe out illiteracy were begun in 1928, the principle of compulsory education was introduced for adults between 18 and 45 who were not attending schools or who could not pass an examination to show that they could read and write in the Latin characters. The classes of the popular or national schools were held late in the afternoon or in the evening. The same practice might be conveniently adopted here. In six years Turkey has solved the problem of the liquidation of illiteracy by these methods. The same set of teachers may be utilized for different types of instruction and even in different parts of the State. The Sonnino Law in Italy made an effort to abolish illiteracy among the scattered population in the southern Provinces and the islands through ambulatory schools and schools with two or three sessions a day. The ravine-stricken tracts, forest and hill areas in Gwalior could be dealt with by ambulatory schools in a similar manner.

The time, place and period for adult instruction will be adjusted to local conditions and circumstances during the months of April, May and June (first term) and again in October, November and December (second term), when agricultural tasks are over. Teachers of the People's Schools will hold their classes in the day time for teaching reading and writing and simple arithmetic to all villagers. This will involve the least interference with the ordinary routine of life of the peasant, without whose co-operation the task of universalizing literacy will be a chimera. Schools



PRESENT LACK OF LEISURE

are depleted or closed even now for several weeks during harvesting operations to meet the exigencies of rural economy. In the villages we can bring the children more easily together by means of moon-light schools (as in certain states in America) held in the chaupal or under the village pipal tree. A school building is not absolutely indispensable when we find as a matter of fact that a large proportion of our primary schools are housed free in the zamindars' huts. During agricultural holidays and festivals, also in melas and markets, the itinerant teacher will be there teaching the three R's. In China they send teachers even to street corners where the rickshaw coolies, if they have a few minutes to spare, are taught reading and writing.

In a big mass drive against illiteracy of adults the adequacy or inadequacy of school building should not, indeed, stand in the way. Gradually the Government should make a free gift of buildings for the People's Schools to house small libraries. Too often the walls of our schools are bare or display pictures which are of foreign origin and on the lowest aesthetic level. Half a dozen boxes carrying books may circulate in an area of 10 square miles round the school, opening up a new vista for the country folk. Each zamindar can in fact start an efficient library service in the village through the periodical supply of selected books to village centres, usually the schools. A few well-chosen books may thus be circulated to an ever-widening circle of villages to stimulate progress-mindedness in the countryside.

A cart filled with book-shelves is an indispensable adjunct of a popular library ; it should go round not merely with books but also with pamphlets, magazines, newspapers, and reading material on current topics to places where libraries cannot be established. Such libraries could become the nuclei of social education, improvement of social manners, popular recreations, games and festivals as in China. To each library building a room may be added for storing a radio set and the equipment of the adults' gymnasium and club. Thus the library building will become the community-centre and a centre for adult instruction as well. In



PRESENT MISUSE OF LEISURE

the well-known mass education movement of Ting-Hsien in China teachers and workers travel from one village to another and are scattered in certain villages and at certain points of the district where propaganda is carried on intensively.

Thus a group of itinerant teachers, attached not to schools but to circuits or particular homogeneous areas, embracing, say, 10 to 15 villages will address themselves to the task of removing illiteracy. A school implies a curriculum : the itinerant teacher's duty is simply to wipe out illiteracy. He may manage very well even 50 pupils in the open air, meet them regularly for three months (one term) consecutively and teach them to read and write in two or three terms as may be found necessary. This may be called the preparatory period and if compulsion is to be introduced at all, it must be in reference to the number of terms required for each adult to attain a minimum standard of literacy. Such limited compulsion for all adults may be introduced all at once throughout the State ; this would avoid the delay of introducing compulsion in selected areas where there is already an adequate number of schools and where public support is forthcoming.

Further, both in China and the Philippines literacy is being achieved with extraordinary ease and quickness ; in India we have to make experiments for adapting our vernaculars to the use of the methods now being employed in these countries with remarkable success. As in China, all pupils should learn the methods of teaching, reading and writing during their last school term and leave school with the intention of spreading these accomplishments. Lam-bach has followed the same plan systematically in the Philippines with remarkable effects on the liquidation of illiteracy.

Efforts should also be made by a provision of stipends of, say, Rs. 5 each, to get the wives of teachers trained and employ them along with their husbands in the task of abolition of illiteracy among girls and women.

In Turkey there is a considerable number of women teachers who are playing an important part in removing

illiteracy in the countryside. Such women teachers could play an important part in the emancipation of the Indian village women. We want thousands of teachers to cope with the problem of mass removal of illiteracy. Our colleges are, on the other hand, turning out *en masse* more boys than can find employment. The majority of these could be sent out to the countryside with a social message. Central training schools would have to increase their number, accommodation, and equipment such as gramophones, cinemas ; and broadcasting courses especially designed for adult instruction would have to be undertaken.

The minimum essentials of History, Geography and Civics and the elements of Science may be taught with the help of the magic lantern and cinema and in this course the adults may also join. This practical continuation course will prevent the lapse of literates into illiteracy which is now such a crying evil. The various lessons in agriculture and sanitation, which the Departments of Agriculture and Public Health stress, may be prepared in the form of books and motion pictures and the children thus prepared for better farming and better methods of living. Perhaps it will be better to have several specialist teachers who will deal with 'practical' subjects and will leave behind a reel, a set of lantern-slides, a box or small travelling library containing a few pamphlets and books of a practical and constructive nature. Gradually these will be adapted to local conditions, materials and problems. The University of Nanking co-operates with the Ministry of Education in China in the production of educational motion picture films and in the reproduction of motion picture copies. All the mobile popular education troupes have adopted the motion picture as their chief instrument. During the year 1942 it travelled through five Provinces, and more than one million persons were benefited. 'Learning words through Pictures', 'World News', 'Wen Tien-hsiang—the National Hero' are some of the best known pictures useful in visual education work in China. A pneumatic-tyred bullock-cart containing a cinema unit, magic lantern, gramophone and a large selection of records along with a wireless set with

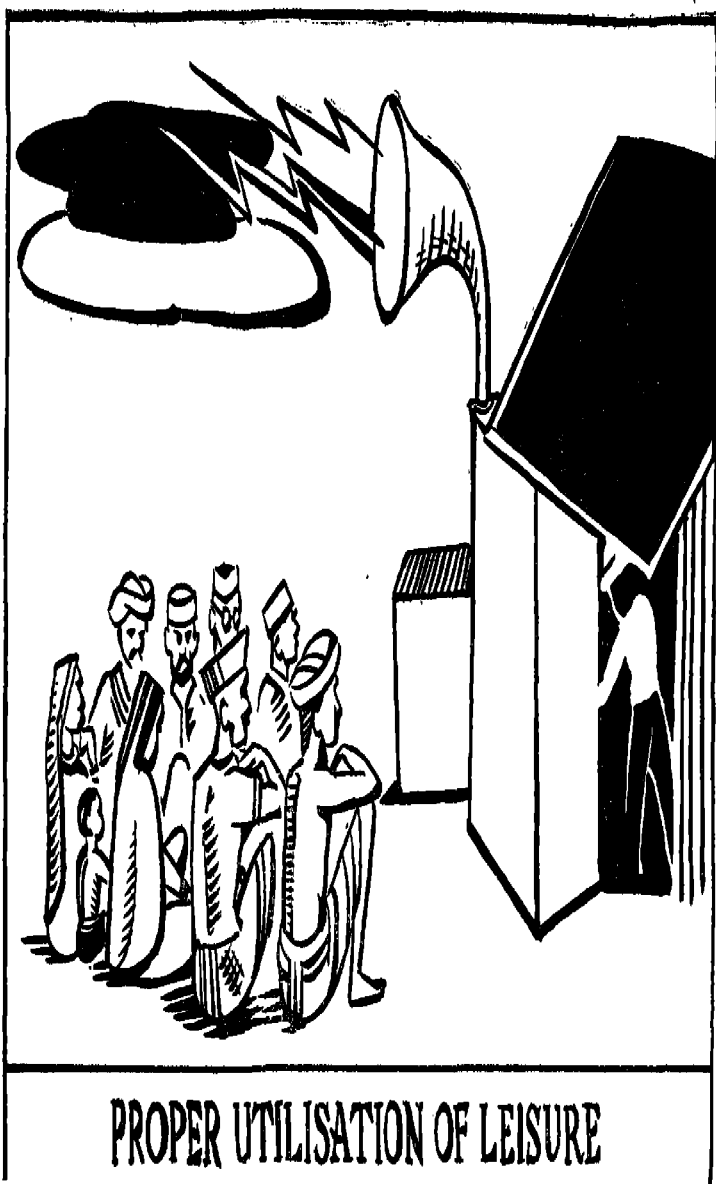
loudspeaker attachment may go round the countryside, staying in a village for a couple of days and moving on.

All advanced countries have found an efficient radio broadcasting system the best medium for the removal of illiteracy and spread of education and for combating the isolation and conservatism of the rural mind. An early implementation of Scheme No. 63 for the establishment of an efficient broadcasting service for Gwalior will contribute materially towards the spread of education and adult instruction in the State.

In China during the initial stage of the mass education movement, of which rural reconstruction programme has been an outgrowth, the effort was concentrated on the removal of illiteracy, the simple texts being mastered by the average Chinese illiterate in four months' time. Beginning with 1929 the point of emphasis of the movement shifted from extensive promotion of literacy to the programme of rural recovery based on an intensive study of local life and conditions.

Similarly in India running through all the activities of adult education should be a programme of better farming, better living and improvement of sanitation and social intercourse—'Education for Life' in the phrase of the founder of the Danish Folk High Schools, N.F.S. Grundtvig. It is well known that the efficiency and ready adaptability of Danish agriculture to changing conditions and the extremely effective practice of agricultural co-operation are due to the training given in the Folk High Schools, famous all over the world. There are sixty of these schools and some 7,000 students pass through them every year.

Through India's sense of legend and history, her love of drama and vocal music and her responsiveness to the spoken word, adult education could take another road different from the road by which peasant boys and girls are now made to travel. The present system fails to make literate five-sixths of the boys and girls who come for primary instruction—makes a few boys literate at an excessive cost. Above all, the education it imparts does not touch intimately the ways of living and learning in the villages. The main



PROPER UTILISATION OF LEISURE

object of mass education in India should be to help towards the modernization of the villages, towards rural reconstruction in the widest sense of the term. Chinese scholars and artists participating in the mass education movement of Ting-Hsien are striving to adapt various cultural media in order to make them effective for the reconstruction programme. Literature, drama, painting, the great characters of Chinese history, and the modern medium of the radio are marshalled for the intellectual and spiritual nourishment of the people as well as for their recreation, for creating a reconstruction mentality among the people and ultimately for rediscovering the 'soul of the race' and revitalizing it for the modern world.

Village story-telling, dramas, folk songs and folk dances, festivals, bhajan parties and Kathas as well as radio talks, fairs, exhibitions and organized competitions and shows of all kinds could similarly play a part in opening out new vistas of knowledge and experience for the peasants' minds in India.

CHAPTER XIII

PUBLIC HEALTH AND SANITATION

Villages in Gwalior, as in other parts of India, have been built without reference to any scheme or plan. As population has increased, there has developed a terrible congestion in the village abadi. Landlords seldom permit any expansion of the abadi without imposition of a heavy nazarana. Often the cultivators move out to unreclaimed wastes, unhealthy depressions or barren shadeless bits of sand-dune. Congestion is serious in the village site everywhere. Sometimes the village is subdivided into different muhallas according to caste. There are, for instance, a Brahmin muhalla, an Ahir muhalla, a Chamar muhalla and so on. In each muhalla congestion is very great. Houses which are usually thatched huts are huddled together at all angles. The courtyards are cramped even when these are relatively large, as several brothers or relations dwell in the same compound. The houses themselves have hardly any windows or ventilators. Most of them are old and require repairs. The ravages of white ants in some parts of Gwalior also lead to the premature decay of many houses. The lanes between houses or groups of houses are narrow and covered with all kinds of refuse and garbage from the houses. Often manure is stored in front or on the sides of the huts making the lanes filthy, especially in the rainy season. The village streets similarly are the dumping ground of the village refuse.

The cattle and their owners often do not live apart from one another ; thus the increase of cattle population aggravates the effects of congestion. An increase of economic pressure which keeps the members of the family together, the levy of nazarna which prevents the extension of house-sites and the social prejudice which prevents the depressed class in particular from obtaining sites for new hamlets conspire to produce congestion which is appalling in

some parts of northern Gwalior or in other tracts where the surrounding low lands circumscribe the village site. Even cattle and goats are packed together with men, women and children and there is little decency or privacy. Often the older men and women sleep outside under the trees or spend the night in sheds on the fields, which they guard against the wild animals. Slum conditions have wellnigh established themselves throughout the countryside, engendering ill-health, depression and a pessimistic outlook among the rural population.

In the outskirts of the villages if a railway line traverses the land, it brings in its train rows of burrow-pits which collect rain water and become breeding pools of malaria-bearing mosquitoes. In dry tracts cactus and other bushes very near the village often become a very serious nuisance accommodating all sorts of filth.

Where the village site is congested, it is the duty of the State to provide land for building new huts or extending the existing accommodation. The State should see to it that the villagers obtain the land easily and cheaply. Where the houses are old, dilapidated and unfit for habitation, the State again should come forward with assistance. A sum should be annually set apart by the State for assistance to needy owners of huts unfit for habitation, in the form of grant of materials, especially free timber from the forests. The existing houses could be improved materially without much expenditure. It should be the business of the Health Staff to direct the villagers for making such improvements as, for instance, the opening of windows and ventilators, sanitary flooring and the location of manure pits and separate cattle sheds. All villages do not have their Bhangis. The State should maintain Bhangis in villages or groups of villages for the cleaning of village lanes and streets and removal of nightsoil, refuse and carcasses of animals. Without the introduction of a universal and economical system of scavenging rural sanitation cannot improve a jot. Scheme No. 93 seeking improvement of rural housing could be greatly improved by these procedures instead of relying upon complete demolition of existing

villages and construction of entirely new settlements by the State.

At the same time the villagers themselves must be persuaded to give their own labour or its equivalent in cash for the repair of village roads, wells and tanks, general clearance, removal of pits, destruction of rank vegetation, or levelling and drainage of depressions. Such works of public utility are carried on by collective labour under the supervision of Panchayats in South India, and there is no reason why this system should not be adopted in the North for reducing insanitation and nuisance in the countryside.

Certain plans for rural houses and layouts for new villages should be prepared by the Public Health Department and a few model villages should be planned and constructed to serve as object lessons. In chaks and blocs reclaimed and colonized by new settlers, the improved layout of villages must be insisted upon. Whenever a village is completely destroyed by fire, it should be rebuilt also on approved lines.

An urgent problem in Gwalior countryside is the scarcity of drinking water supply. In certain districts wells are far too few, and men and women have to traverse long distances, sometimes even up to ten miles, to obtain drinking-water. The worst districts in this respect are Sheopur, Shajapur, Guna and Sardarpur. This will be evident from TABLE XLII opposite.

But perhaps even these figures, taken from the Census Report, do not reveal the true picture of things, since a recent survey of water supply conditions in Sheopur shows as many as 109 villages suffering from scarcity of drinking-water, that is, about 10 per cent of the total number of villages, as compared with the 4.34 per cent mentioned in the Census Report. A sum of 10 lakhs of rupees has been set apart by the Gwalior Durbar for the construction of wells for supply of drinking-water. The supply in rural areas could be improved in the following manner :

(1) Construction of new masonry wells which may be provided with hand or mechanical pumps, proper platforms and parapet walls as well as reservoirs to ensure

safety from contamination.

(2) Repair and re-boring of masonry wells or insertion of new tube-wells therein.

(3) Construction of new tube-wells run by a hydro-electric grid or by a central power-house run by steam in the rural areas.

(4) Construction or reservation of tanks and reservoirs for drinking-water.

These different methods have to be combined according to resources and levels of the sub-soil water in different regions in order to combat successfully the chronic drinking-water shortage in several localities. The needs of the untouchable classes should in particular be kept in view in this connexion. All step wells in Malwa Prant should be gradually converted into draw-wells.

TABLE XLII
Scarcity of Drinking-Water in Gwalior State

Serial No.	District	Number of villages that obtain water from a distance of 1 mile or more	No. of Total villages	Percentage of (3) to (4)
1	2	3	4	5
1.	Sheopur	125	515	24.30
2.	Shajapur	85	1,017	8.35
3.	Guna	109	1,908	5.71
4.	Sardarpur	32	574	5.59
5.	Mandsaur	44	879	5.00
6.	Bhilsa	41	936	4.39
7.	Shivpuri	55	1,267	4.34
8.	Ujjain	43	1,083	3.99
9.	Gird	30	819	3.65
10.	Morena	26	784	3.31
11.	Bhind	17	816	2.08
	Total	607	10,598	5.72

It is an admitted fact that medical aid is scanty in rural areas for both ordinary and epidemic diseases. In many villages we visited medical aid of any kind is altogether absent and branding by iron is resorted to as a com-

mon practice for all sorts of ailments. TABLE XLIII gives a rough idea of the total population that does not obtain faci-

TABLE XLIII
Distribution of Hospitals in Gwalior

Serial No.	District	Percentage of total population living in villages which from the nearest hospital or dispensary are at a distance of		
		Within 5 miles	5—10 miles	Above 10 miles
1.	Gird	53.6	32.8	13.6
2.	Bhind	55.2	39.6	5.2
3.	Morena	22.6	47.1	30.3
4.	Sheopur	30.2	24.5	45.3
5.	Shivpuri	19.3	38.5	42.2
6.	Guna	34.9	41.8	23.3
7.	Bhilsa	22.8	34.0	43.2
8.	Ujjain	42.1	38.7	19.2
9.	Mandsaur	39.3	34.6	26.1
10.	Shajapur	47.3	44.4	8.3
11.	Sardarpur	53.3	37.1	9.6

lities of medical aid. More dispensaries should be opened in all the larger and central villages. The travelling dispensaries are also too few and quite ineffective in dealing with epidemics which usually affect a large number of villages simultaneously ; they cannot undertake even the usual curative work. In the summer of 1945 cholera broke out in an epidemic form in as many as about 200 localities, the seizures and deaths being 12,101 and 5,710 respectively in the course of ten weeks. In Czecho-Slovakia where the health conditions in the villages are not much superior to those prevalent in India, a system of subsidy to village medical officers in self-supporting Health Unit circles, who may charge small fees from the patients, has contributed a great deal towards the treatment of diseases and improvement of sanitation. Scheme No. 21 which recommends the institution of 30 subsidized medical practitioners for 6 Allopathic and 24 Ayurvedic and Unani centres, should be enlarged in scope for the rural areas and implemented early. As soon as an adequate number of medical men is

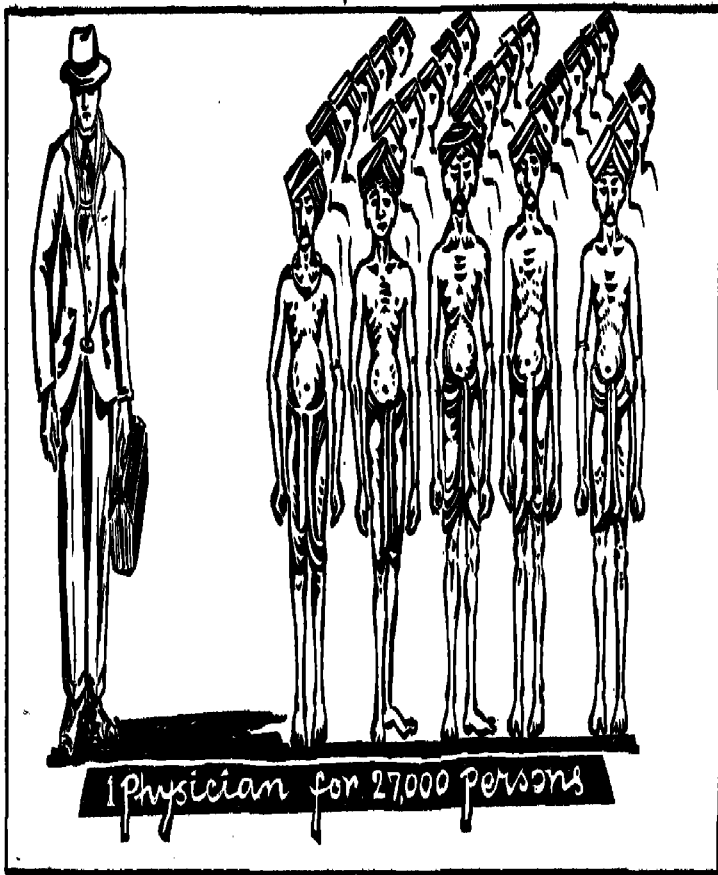
available in the State—and the establishment of the Medical College will contribute towards this—the development of private rural practice by an extensive scheme of subsidies, with initial equipment and medicine, should be pushed in the rural areas. In some Provinces of India a similar scheme of a self-supporting dispensary for a circle of five villages is proposed to be instituted. But till such time as fixed dispensaries could be multiplied sufficiently by Government, travelling dispensaries are a necessity and there should be at least one such dispensary in each district which will deal with epidemics as well as treat diseases in the rural areas.

Teachers in village schools and village guides should be trained by the Public Health staff and by the doctors attached to travelling dispensaries, so that they can render first aid and administer such simple remedies as quinine for malaria and iodine for cuts and also take precautionary measures in cases of epidemics. The rural health programme of the Ting-Hsien mass education movement in China is carried out in the following manner :

Beginning with the local village, capable literate young men have been selected and given a ten-day course in first aid, medicine, and sanitation, after which each is given a box containing simple drugs, vaccine for smallpox and first aid appliances. These men keep records of births and deaths, look after wells and general sanitation and take care of the simpler cases of illness or accident. They belong to the Peoples' School Alumni Association of the villages and receive regular supervision from the physician of the Sub-District Health Station, which is equipped to take care of the more serious cases. The District Health Centre covers the entire region, having a hospital, a laboratory as well as the administrative offices and class-rooms.

Indigenous dais should be induced with stipends of Rs. 8 to 10 per mensem each to obtain training for a few months in a neighbouring town which has a hospital for women. The number of trained midwives in the rural areas has to be increased very considerably. Such trained dais could in their turn train dais in their own tahsils.

Present lack of Medical aid



1 physician for 27,000 persons

TARGET FOR HEALTH I



District Boards should frame bye-laws under the District Boards Act for the registration of midwives when an adequate number of trained dais is available. Similarly the State would require more trained nurses, compounders and health visitors. Scheme No. 20 which provides for the training of 10 dais, 2 midwives, 13 nurses, 10 compounders and 2 health visitors each year is well-conceived and deserves very early implementing.

The medical service in Gwalior is at present constituted by 141 qualified physicians and surgeons and 42 nurses, besides 48 Vaidis and Hakims. These are distributed among 11 special hospitals and dispensaries, 8 first class dispensaries, 15 second class dispensaries, 19 third class dispensaries and 8 fourth class dispensaries, besides 42 Ayurvedic and Unani dispensaries. In addition there is 1 leper asylum, 1 mental hospital, 2 maternity homes and 4 child-welfare centres. The total accommodation available for indoor patients is 964 beds in hospitals, and 176 beds in maternity homes. For village sanitation in the State there are 4 sanitary officers and engineers undertaking propaganda and improvement of water supply in two districts, viz. Sheopur and Sardarpur. The Census of 1941 recorded 148 registered medical practitioners including 17 women practitioners. This works out at 1 qualified medical practitioner for 27,000 persons on an average. The standard should be at least 1 physician, 1 nurse and 1 dispensary for every 1000 persons. In England there is one doctor per 773 persons, and one nurse per 435 persons. The Bombay Plan envisages a dispensary for every Indian village, which has on an average a population of 517 persons, to be manned by a qualified doctor assisted by two qualified nurses, one of whom at least should be a trained midwife.

The situation calls for immediate extension of medical and sanitary services that should reach the rural population. Scheme No. 80 proposing to set up the nucleus of the organization and supervision of public health work in rural areas should be immediately adopted, enlarged and speeded up so that the district sanitation work throughout

the State may begin at once. Much preventable mortality and suffering can indeed be reduced through the multiplication of hospitals, dispensaries, maternity and child-welfare centres, properly equipped and manned by adequate and qualified staff. (Scheme No. 81)

The public health and sanitation targets can be now briefly set forth as follows :

1. Health Units should be established in each pargana catering to the needs of a population of about 1,00,000. The staff should be as follows :

(i)	Medical Officer of Health	..	1
(ii)	Woman Medical Officer	..	1
(iii)	Sanitary Inspectors	..	4
(iv)	Midwives	.. ..	8
(v)	Indigenous Dais	..	12
(vi)	Health Visitors	.. ..	4

The staff should be increased in proportion to the size of population in each pargana. Priorities for the establishment of health units should be according to the density of population and prevalence of endemic diseases.

2. Each pargana should have a hospital with an adequate number of maternity beds. The target should be 40 beds for every 10,000 persons. Qualified local physicians and surgeons might be associated with pargana hospitals with appropriate honoraria. All district hospitals should be modernized.

3. There should be a dispensary and a maternity home for every 1,000 persons in a village or group of villages in charge of a qualified physician with two nurses to assist him. In Gwalior there are 535 villages, each with a population of 1,000 or more. Each of these should be provided with a dispensary and a maternity home.

4. In a circle of 10 villages, there should be a subsidized cottage dispensary, the local physician, whether Vaid, Hakim or Allopathic Physician, being given an honorarium and allowed private practice. The Village Physician should be induced to settle permanently through the grant of 5 acres of land or of a house worth Rs. 2,000 that may become his own property after he has practised

in the village for 20 years. The staff here should comprise the following :

One Trained Nurse-midwife at Rs. 15 p.m.

One Sanitary Assistant who is given training in public health duties and regulations, at Rs. 25 p.m.

Two Sweepers at Rs. 10 each.

Recurring grants for the expenses of the dispensary including free distribution of medicines to deserving cases should be fixed.

A non-recurring grant of Rs. 100 for initial equipment will also be necessary.

For purposes of control of epidemics, the Village Health Units should be linked with the Travelling Dispensaries.

5. Until a complete net-work of rural health units becomes feasible, there should be established in the affected areas special centres for the treatment of malaria, guinea-worm, hookworm, etc. Scheme No. 118 seeks the formation of one anti-malaria unit for malaria investigation and control measures.

6. There should be a Travelling Dispensary for each of the 11 districts for :

(i) Control of epidemics in epidemic seasons ;

(ii) Medical aid in areas not already catered by any health units or dispensaries.

The staff should consist of :

One Sub-Assistant Surgeon ;

One Compounder (Also trained in vaccination) ;

One Ward Coolie ;

One Driver (Motor) } For a motor lorry with

One Cleaner } camp equipment.

7. A medicine chest with emergency medicines should be supplied to each school which should nominate a teacher for a course of training in public health duties and regulations, first-aid and medical relief to emergency patients. An honorarium of Rs. 5 should be given to him by the Medical Department.

8. There should be provision for the construction of new wells and restoration of old ones especially in areas

where wells are scarce due to the fall of sub-soil water level. The target should be to provide an adequate protected water supply in all villages. A special sum of Rs. 1,00,000 should be set apart annually for this purpose.

Such wells should be provided with pumps and reservoirs and periodically examined so as to ensure freedom from contamination. All step wells should be converted into draw wells. All wells should be thrown open to all, regardless of caste and creed.

9. Improvement of rural housing such as represented for instance by :

- (i) Introduction of windows
- (ii) Addition of verandahs in front of cottages
- (iii) Suitable flooring
- (iv) Provision of separate cattle sheds or outhouses for animals
- (v) Removal of congestion and extension of the village site
- (vi) Planning of village lanes and streets with reference to temples, village meeting places, etc. and improvement of layout of villages in cases where these are being removed and rebuilt or where new extensions are being laid out to mitigate congestion.

A sum of a lakh of rupees should be set apart for each district for grant of materials, particularly tiles and timber to needy owners of houses unfit for habitation.

Levy of any impost or nazarana by the landlord for the extension of the house-site should be regulated so that the village site could expand with the increase of population on payment of reasonable premiums to the landlord.

10. Rural sanitary improvement should begin along these lines :

(i) The digging of manure pits by the villagers on the fields at a distance of at least 200 yards from the abadi. Their location, filling and depth should all be planned by the Health staff who after fixing the sites for manure heaps should supervise their operations.

(ii) Use of such manure pits as latrines and the

TARGET FOR HEALTH II HOUSING.



A RURAL SLUM



A WELL-VENTILATED CLEAN COTTAGE.

regular removal of household sweepings, cowdung heaps and feeding residues of all kinds to these pits. The making of compost from all kinds of waste vegetable matter, wood ashes, urine, earth, cowdung and human excreta should be taught and popularized.

Target for Health III Medical aid



A village hospital for every 1000 persons

- (iii) Provision of soakage pits for waste water.
- (iv) Levelling, filling and drainage of depressions that are too many and too near village sites. Diversion of the waste water flow and drainage may often greatly improve the present nuisance.
- (v) The field latrine should be kept at a distance of at least 300 yards from the abadi. In the selected area demonstrations as well as direct propaganda must be directed by the sanitary staff towards the above objects. Health weeks, baby shows and home visiting should be organized.

TARGET FOR HEALTH IV



PROTECTED DRINKING WATER FOR EVERY VILLAGE

(vi) A vigorous campaign should be launched against rats ; rat medicine should be freely distributed and local rat-killers should be trained for the area.

(vii) A campaign for inoculation, vaccination, use of soap and phenyle and mass quininization (in the eastern districts) should also be undertaken.

(viii) The provision of latrines and bathing places especially for women and children. Absence of privacy often leads to the omission of bathing, which is a pastime of women in Bengal with her innumerable shady tanks, rivers and minor streams.

(ix) The throwing open of all wells built out of public funds to every one regardless of caste and creed. In most districts large sections have to obtain drinking-water from wells which are in an unsatisfactory condition or are positively insanitary and in several districts members of the depressed castes have neither wells of their own nor are allowed to draw water from village wells. All wells should be parapeted, cleaned periodically and permanganated when necessary. Drinking-water is very poor in the forest areas ; while in the arid and ravine stricken tracts there is an actual scarcity of drinking-water supply.

11. Maternity and child-welfare work should be taken up in the villages, and village midwives should be trained for the area. The child-welfare movement should definitely adopt as one of its principal objects the broadcasting of practical knowledge about the use of contraceptives. Where child-welfare centres have been started, these could easily become birth-control clinics. Population in the rural area is increasing much faster than the cultivated area, the total out-turn from the land and the facilities for primary instruction and mass sanitation. The outlets of migration have been restricted and the progress of industrialization also is exceedingly slow. The movement of rural reconstruction, or as a matter of fact any programme of economic uplift and social welfare, is bound to fail in its objects if in the meanwhile a rapid multiplication leads to an all-round lowering of social standards. It is time that both Government and people realize the gravity of the



PRESENT SOCIAL INEQUALITY

Social Equality



Abolition of untouchability & other barriers

population question in the State and no longer fight shy of a policy of population restriction.

Such plans and programmes as indicated above are calculated to reduce mortality and disease in the State materially and improve the average longevity of the population. The 1941 Census records a birth rate of 16.3 per mille and a death rate of 11.0 per mille as averages for the whole State, between 1931 and 1941. Vital statistics as recorded in the State appear to be highly unreliable. The above figures give an increase of 1.8 lakh persons from 1931 to 1941 while the actual increase was 4.8 lakhs. This of course cannot be explained by immigration. Mr H. M. Bull's detailed figures of 13 villages surveyed in different districts of Gwalior in 1938-39 show on the basis of their population a birth rate of 37 per mille and a death rate of 27 per mille.

TABLE XLIV
Vital Statistics in the Rural Area

Serial No.	Village	Births per 1,000	Deaths per 1,000
1.	Daulatpore	37	27
2.	Ingoria	26.4	66
3.	Deo-ki-khajuri	53	38
4.	Masoodpore	39	25
5.	Dhundarka	33	55
6.	Kanat	36	34
7.	Magrola	54	13
8.	Satanwara-kalan	14	13
9.	Lukwasa	43	15
10.	Mangrol	15	13
11.	Antri	16	10
12.	Penchi	61	21
13.	Ramsar	56	17
	Average	37	27

These figures are probably nearer the truth. The U.P. recorded in 1938 a birth rate of 33.6 and a death rate of 23.6 per mille.

Our health target should be to obtain an average expectation of life of 48 years which is possible on the basis



of mortality ranging about 16 and a birth rate of 25 per mille. The reduction of disease, mal-nutrition and preventable mortality and the associated mitigation of poverty will do more for the immediate promotion of human welfare in Gwalior than any other single measure for post-war planning which can be devised.

CHAPTER XIV

RURAL INDUSTRIES

Agriculture is a more uneven occupation in Gwalior than in other parts of India where irrigation or equally distributed rainfall makes farming relatively continuous. A very small proportion of the cultivated area in Gwalior is do-fasli. • Dryness and infertility rule out an arranged succession of crops in the northern districts of Gwalior, while in a district like Bhilsa excessive rainfall is responsible for a striking diminution of kharif cropping. It has been estimated that in Northern India, even in the irrigated zones, agriculture cannot give employment for more than 200 days in the year. Agricultural idleness is much more chronic here than in Northern India. On the other hand, mixed farming, as adopted in the Meerut Division for instance, which gives some regular employment to cultivators throughout the year, has hardly developed in the State.

The large gap in the agricultural time-table has to be filled up in order that the standard of living of the peasantry can improve. Particularly in such districts as Bhind, Morena, or Bhilsa agricultural operations are much limited due to soil conditions and deficiency or excess of rainfall. Both economic activity and standard of living nowhere show sharper fluctuations than here. A programme to help the rural population to start and carry on rural industries would accordingly form an important feature of the planning of Gwalior's countryside.

Many big villages in Gwalior still show the usual complement of artisans who are paid in shares of grain at each harvest. There are the village barber, washerman, chamar, potter, blacksmith, and carpenter. Generally speaking, their perquisites vary from 10 to 20 seers of grain per family on an average during the year. As in other parts of India this share of grain is adjusted to fixed quotas of work, but for any extra work additional remuneration is usually

given, while on special occasions and festivals all artisans receive cash and food. Without this complement of village functionaries and artisans agriculture cannot go on for a single day. The time-honoured village crafts are carried on according to the ancient routine with primitive appliances. There is no attempt at craftsmanship or specialization. As a matter of fact many artisans ply their craft along with agriculture and only in their spare time. Similarly many cultivators during their slack season are engaged in making sutli, ban, or rope, or again, matting. Such subsidiary employment is, however, much less in vogue in Gwalior than in other parts of India due to the large employment of rural labour for fuel-cutting or collection of various products from the forests adjoining the villages.

Some amount of specialization is, however, represented by the Kolis or weavers who weave hand-spun cloth and 'khes' out of local cotton and sell these in the periodical markets in the towns or bigger villages. A shining example is afforded by the weavers' families in Mangrol, pargana Sabalgarh, who in return for the yarn supplied to them by the Khadi Bhandar at Sabalgarh supply khadi and other materials annually worth Rs. 2,400 to the Khadi Bhandar which exports them to Bombay and Ahmedabad. Thirty spinning wheels hum in the village by means of which the people spin yarn out of the slivers supplied to them by the Khadi Bhandar. Three Kanderas in the village clean the cotton and make slivers out of it.

TABLE XLV opposite gives a rough idea of the specialized village arts and crafts in the Gwalior State :

One of the best known of the cottage industries of Gwalior whose products command outside markets is Chanderi weaving. A brief account of this industry and its organization will indicate the major drawbacks of the cottage industries and handicrafts of Gwalior and also the lines of rehabilitation. The industry gives employment to about 260 families of weavers who make safas, saries, lungdas, dandiyas, duppattas, etc. of very fine and artistic quality that command a wide market in the Deccan. Fabrics made of silk warp and cotton weft and interwoven with bright gold

TABLE XLV
Specialized Rural Crafts in the Gwalior State

Serial No.	Name of the District	Number of families engaged in				
		Tanning leather	Cotton Spinning	Carpentry wood carving	Pottery	Miscellaneous
1.	Gird	46	92	20	50	54
2.	Bhind	125	85	14	134	83
3.	Morena	219	171	20	4	28
4.	Sheopur	222	2	14	..	19
5.	Shivpuri	3	73	37	17	76
6.	Guna	579	107	110	105	400
7.	Bhilsa	445	5	126	199	161
8.	Ujjain	108	44	115	64	33
9.	Mandsaur	63	70	199	37	..
10.	Shajapur	81	101	30	40	56
11.	Sardarpur	28	7		3	165
Total		1,929	757	685	653	1,075

and silver threads and embroidered with flowers fetch very good prices even in the distant markets of Surat, Ahmedabad, and Poona. Chanderi weaving resembles very much the well-known Benares handicraft and the technical methods of working out designs, both on the ground and the borders, resemble those adopted by the Benares weavers, but on the whole Chanderi fabrics are more expensive. It is estimated that about 400 looms at Chanderi produce annually about 13,000 to 20,000 cloth goods worth Rs. 3 to 4 lakhs. Formerly the local Kateryas used to spin, as in Dacca, very fine yarn rising up to 300 counts. Now fine yarn is imported from the mills of Bombay, Sholapur, Ahmedabad, while the gold and silver threads are imported from Surat. The Sahukars who import these raw materials, including yarn, gold and silver threads and dyes, and supply these to the weavers have managed to keep the weaving population under their thumb. More than in other industrial centres, the Sahukars have been able to keep the weaving community in debt bondage by small advances for satisfying their household needs from time to time, compel-

ling them to accept piece-rate wages which they dictate, and employing them full time or partially as they choose. The average monthly earnings of the Chanderi weavers, estimated at only 6 to 8 as. per diem, are much lower than those of weavers in Gohad or Bhandar who weave ordinary cloths. On the whole during the last two decades the Sahukars have taken advantage of the situation in reducing the piece-rates for weaving ordinary fabrics by half to one-third. Besides, there are deductions when the fabrics fall short of the standard of craftsmanship. This is indeed a paradox—that the most artistic weavers of Gwalior earn so little ; it is to be attributed to complete lack of organization and modernization, on both the production and the distribution sides.

Not far from Chanderi, at Esagarh, there are quite a number of weavers who are making fabrics similar to the Chanderi products. Here also there is complete lack of integration and modernization.

The exploitation of the artisans by the money-lenders and agents who hold the whip-hand because of their virtual monopoly in respect of both the supply of raw materials to the artisans and of finding out a regular market for the industrial products is true of most arts and crafts of Gwalior. Take for instance, another important industry, viz. blanket-weaving at Mandsaur, giving employment to about 1,500 weavers and producing kambals, felts, etc. worth about Rs. 2½ lakhs. Here again, the blanket-weavers have come under the control of money-lenders who give them advances at an exorbitant rate of interest for purchasing wool from the Gadariyas. By such advances the money-lenders manage to obtain a monopoly of all the blankets produced in the locality and they also determine the labour charges per blanket which come to only 8 as. per blanket. The blanket-weavers under such conditions earn on an average only Rs. 6 to 7 per mensem. Fortunately the monopoly is now broken due to the operations of the Government Blanket Cottage Industry Centre, which advances money and supplies wool at cost price and also loans to the weavers, most of whom have redeemed their debts by the sale of their

blankets. Their rate of earnings has also increased from 8 as. to Rs. 2-8 or Rs. 3.

It is unfortunate that the village arts and crafts of Gwalior have decayed more quickly than in other regions. Some of them that were once thriving are dead or are quickly dying out. Yet industries that are of an artistic nature and are run by artisan groups that have acquired hereditary skills and aptitudes can be re-established without much difficulty, and can command even markets outside the State provided their technical methods, supply of raw materials and marketing organization are rationalized. Among these artistic and semi-artistic industries are zari and artistic cloth-weaving at Chanderi, Esagarh and Shajapur, stone carving in Gwalior and Shivpuri, wooden toy and papier-mâché making at Sheopur, Sabalgarh, Lashkar, and Kachrod ; blanket-weaving at Mandsaur, artistic leather-work at Badnagar and Ujjain, cloth-printing and dyeing at Javad, Tarapur, Ujjain and Mandsaur ; and metal work at Lashkar. It is note-worthy that even in their disorganized state such handicrafts as zari cloth-weaving of Chanderi, kambal-weaving of Mandsaur, cloth-printing of Javad and gota-weaving of Lashkar command markets outside Gwalior ; while within Gwalior inter-district markets are obtained for the wooden toys of Sheopur and Sabalgarh, the artistic shoes of Badnagar, the metal work of Gwalior and Ujjain and the earthen wares of Bhind.

The plan of development should be for the State to set up Model Industries Establishments in those centres where the possibilities are greater for turning out high grade artistic products that can capture a wide market. The State has already made considerable strides in the development of Government-owned large industrial establishments. It should also make itself directly responsible for the re-organization and development of cottage crafts.

Such Model Industries Establishments should be run by the State in selected industrial centres for the following four major objectives :

(i) Training and demonstration among the artisans of improved implements, machinery, and methods.

(ii) Discrimination of new and improved designs and planning of production according to the demands and tastes of consumers.

(iii) Cheap supply of raw materials to the artisans.

(iv) Organization of marketing.

The Chanderi Textiles, Gwalior, is a Government institution of the right type for the resuscitation of a once thriving but now moribund industry. The gracious grant of Rs. 1 lakh by the Durbar to ameliorate the condition of the weavers at Chanderi is a good augury for the development of cottage industries in the Gwalior State. Much remains to be done, however, for Chanderi. For the all-round improvement of the economic condition of the Chanderi weavers, the following measures seem urgent :

(i) The improvement of the process of warping by the adoption of warping drums or wheels attached to frames, as in all important handloom weaving centres of India.

(ii) The introduction of jacquards on a large scale for the production of cheap varieties of ornamental cloths. This would not degrade craftsmanship as is often supposed but would enable the weavers to improve their income by making cheap varieties of artistic cloth goods that may have a wide sale. The production only of zari saris and duppattas that are bought only by the richer class cannot indeed improve the economic status of the weavers who should be encouraged to produce types of artistic cloth goods of a cheaper variety, the sales of which might not be limited to the upper class nor restricted to social festivals. Benares fabrics range from costly brocades to cheap goods that cater to the needs of a much bigger circle of customers.

(iii) Handloom products often fail to obtain good prices because of the lack of finish in appearance. As finishing machinery and appliances are costly and beyond the means of weavers, the Government should set up a calendaring and bleaching plant at Chanderi.

(iv) The improvement of designs is essential for the popularity of Chanderi goods. As important as the quality of weaving, the endurance of the texture or the fastness of

the colours are novelties in border design, make-up, spacing and ornamentation of the ground, or in the blend of colours. Benares, Madura, Surat, and Dacca—all produce a constant stream of up-to-date designs, and design improvement largely holds the key to the prosperity of artistic weaving in these centres. Chanderi designs can be improved in the following ways :

- (a) Commissioning artists of the Indian School to produce designs following the traditions of the Bagh frescoes or Gwalior temple frieze and lintel decorations, for instance.
- (b) Close study of the fashions and tastes of such important markets as Calcutta and Bombay which rule preferences in India.
- (c) The appointment of an artistic designer at Chanderi trained in the Indian art traditions.
- (v) Establishment of Co-operative Societies or stores which will encourage weavers to buy their cotton and silk or gold and silver threads through them or through a secondary body to which the Co-operative Societies may be affiliated. Advances in cash and capital for the purchase of cotton and silk yarns and improved appliances for looms should be given and weavers discouraged from selling goods independently and encouraged to sell them to Co-operative Societies which would be offering them valuable services.
- (vi) Establishment of debt redemption societies for the weavers and scaling down their debts to the Sahukars.
- (vii) The enlargement of the scope of training in the Institute so that it may serve as a model demonstration workshop for artistic weaving.
- (viii) Organization of welfare work among the weavers' families.

The scheme for the development of the handloom industry at Chanderi should be supplemented by a more comprehensive planning to include State help to other cottage industries and handicrafts through technical information, education, advertisement and marketing.

For this purpose the Industries Department should be strengthened by proper technical staff which should under-

take the following measures with a view to systematic planning and development.

1. Arrangement for the supply of raw and semi-finished material to cottage producers through Co-operative Artisan Societies. Where a co-operative organization among the artisans is not immediately possible, stores will have to be established in the chief industrial centres as branches of a Central Marketing Organization serving the dual purpose of the supply of raw materials and appliances, where the artisans have to pay abnormally high prices for them, and stocking cottage handicraft products for sale.

The Central Marketing Organization, working in association with the Gwalior Industrial Museum at Lashkar, should co-ordinate and integrate the business of the chain stores in the district towns and all important industrial centres in the countryside.

The marketing organization established for giving facilities of supply of raw materials and marketing for all cottage production should be for the present financed through a State grant.

2. Advising on improvement and reconstruction of processes in village and cottage industries, of spinning, weaving, tanning, dyeing, basket-making, rope-making, blanket-weaving, pottery, wood-work, and cutlery.

3. The introduction and application of modern mechanical implements and tools not yet widely used in cottage production, e.g. fly-shuttle looms in weaving, gauges, improved saws, planes, tables and lathes in wood-making, punching and shape making machines, improved moulds and lathes in metal work, improved oil-presses and cane crushers, etc. Fly-shuttle looms and carding, milling and finishing machines will place blanket-weaving in Mandsaur on a sound footing just as small sizing and calendering machines will improve the prospects of artistic handloom weaving at Chanderi and a small nickel-plating plant and buffing, polishing, handle-making, and packing machinery in Lashkar and Ujjain may greatly improve the standard of production and give the metal trades great impetus to expand their markets.

Along with Master Weavers for the handloom industry some Supervisors for the other arts and handicrafts will have to be appointed for the important industrial centres, who would introduce improved methods, tools and appliances among the different kinds of artisans, get articles made according to requisite standards of craftsmanship and stamp these with approved marks or brands. The new appliances should be lent to artisans, preferably to those organized co-operatively, and the artisans should be induced to buy them on the hire-purchase system or otherwise. Appointment of technical teachers, technicians and designers for the rural industries has been envisaged in Scheme No. 27.

The Principal of the Lashkar Technical Institute should be entrusted with the task of supervision and improvement of the important arts and crafts of Gwalior, and undertake touring in the industrial centres to be able to deal with all the technical problems of the industries. This is specially important for handloom weaving, cabinet-making and artistic wood-work, metal work, leather manufacture, glass and oil industries. The School of Fine Arts proposed to be established in Scheme No. 28 should have an Arts and Crafts Section that will specially devote itself to evolving new designs, in consonance with art traditions, for all the arts and crafts of Gwalior.

4. The introduction of improved designs of Oriental art of textile, furniture, metal work and pottery. The State must be prepared to meet any preliminary losses due to the failure of designs in the market which are intended in some measure to educate public taste.

5. Collection and diffusion of information relating to marketing. Commercial travellers not merely for Chanderi weaving but also for other arts and handicrafts should be appointed who will visit important cities and find out for which classes of goods of cottage production there are markets. They will also take samples from the Gwalior industrial Museum and canvass for orders.

It is necessary to utilize as much as possible the spare

time of all cultivators—whether tenants whose holdings are too small to employ their families throughout the year or agricultural labourers who are chronically under-employed. Many ancillary industries could be developed and organized which would relieve unemployment and add to the income of the rural population. Mixed farming has great possibilities in Gwalior but its development must rest on a commonsense view of animal keeping, stall-feeding and introduction of fodder crops. Besides dairy production, sheep, goat, and poultry farming can provide useful and lucrative subsidiary employment. Schemes 46 and 110 for sheep, goat, and poultry improvement have thus an important bearing upon the increase of rural employment and improvement of both income and nutrition for the rural population. Other ancillary industries can be easily and usefully developed in Gwalior countryside. The easiest to adopt are rope and twine-making, basket-making, wicker work, fan-making, and cotton spinning. Such industries can be combined with regular work on the land. Rural areas often provide raw materials for many arts and crafts of the more specialized sort that may be carried on on a cottage scale with great economic advantage for those who ply them. Among these may be mentioned wool-spinning and blanket-weaving, tanning and leather work, durree-making, bidi-making, carpet-making, embroidery work, toy-making and papier-mache. Everywhere, however, the cottage production has to be approached from the marketing side. The organization of marketing, and hence indirectly of credit and finance, holds the key to the rehabilitation and development of cottage industries.

CHAPTER XV

PRIORITIES

We have considered the planning of the countryside of Gwalior from different angles. Schemes of development are linked with one another; and in a total plan of development it must needs be assured that development in each sector goes on according to its specific, predetermined targets—which is seldom possible without corresponding development in other sectors. Yet rational over-all planning is also a matter of determination of priorities that must vary in different countries and stages of social progress.

On the whole the top priority should be given in Gwalior, as in most parts of India, in respect of protective rather than developmental measures. Schemes that would enable the countryside to fight successfully drought, famine or any other agricultural calamity and disease or epidemic for both the cattle and the human population, ought to receive the highest priority. These would include schemes of canal and well irrigation, erosion control, dissemination of drought- and disease-resistant seeds for crops, introduction of dry farming methods, protection of crops against pests, insects and animals and the like. Livestock and men have to be safeguarded against both endemic and epidemic diseases. Without relative immunity from the effects of vagaries of rainfall and from periodic outbreaks of insects and parasites that work havoc with crops, cattle and men and render life recurrently or chronically precarious, no basis of economic and social progress can be found. Accordingly irrigation, erosion control, prevention and treatment of crop and cattle diseases, public health and sanitation measures should be included in the top priority scale.

Intermediate in the scale of priorities are the measures providing for stability and security of subsistence and employment, which in the case of the agriculturist would mean permanent rights in the land, fair rents and protection from

usury or exploitative credit. Reform of tenancy, rationalized credit and marketing belong to the second scale of priority. The fixation of wages, hours and conditions of employment of agricultural workers, colonization and settlement of the landless classes in virgin areas and similar projects for the stabilization of agricultural labour conditions as well as the development of rural public works employing surplus labour may also be included in the same category.

Next in order of priority are all developmental programmes and measures leading towards better land utilization and agricultural production, that form the indispensable economic basis for reaching the targets for improved leisure, culture and happiness. The basis of the latter is also furnished by the liquidation of illiteracy and emancipation from outgrown social customs, prejudices and superstitions. Both the nature and tempo of progress of an agricultural community are limited by the scale of progress in agriculture and the capacity for co-operative organization and socialized living that rests on education in the widest sense of the term.

Finally, it is clear that agricultural and rural reconstruction cannot be assisted or given priority unless they are linked with the development of communications and industrialization that not merely reduce economic isolation, excessive dependence upon agriculture and chronic unemployment but also break down the mental and social inertia of the people. All developmental measures are based on diversified employment and improved communications—industrialization associated with a rationalized or mechanized agriculture based on secondary crops and raw materials rather than subsistence crops.

As a community successfully tackles the first and vital needs of protection, ease, and security of living, it finds that the priorities which were low at the beginning of the plan would step up in the scale for all-round technical and human efficiency and progress as the plan progresses.

From the improvement of the people's *security* of living and employment, health and nourishment to the improvement of their amenities and *standard of comfort* that

will aid and will be aided by industrialization, the basic objectives will be linked up in the development of the overall plan with the intermediate and final objectives. The plan will no doubt commence with wells and canals, contour bunds and terraces, agricultural and bull-breeding farms, schools and dispensaries. But the easing of toil and working conditions and improvement of leisure and capacity for enjoyment inevitably lead to a desire for the amenities of decent, civilized existence among the masses.

Large-scale heavy and light industries with their varied products from brick buildings and furniture to radio sets and motor cars for mass consumption will assist this social transition and their priority, therefore, will loom upon the course of planned industrialization. Besides, it is the heavy engineering industry supplying cheap tractors, pumps and other agricultural machinery, and the chemical industry supplying artificial fertilizers, that gives an impetus to scientific agriculture. A net-work of industries, large, medium-sized and small, established in the countryside through the facilities of cheap hydel power and transport will utilize the industrial crops and raw materials from which the agriculturist's income will appreciably increase, abolish rural idleness and lead to a more equitable distribution of wealth and purchasing power among the urban and rural classes. More technical skill and science in the countryside will mean greater social alertness and intelligence.

This will inevitably bring about a change in the time-honoured land distribution. The pattern of scientific farming, whether represented by small peasant holdings with State aid, or co-operative effort in various directions, or by large mechanized farms organized on collectivistic lines, will largely depend upon the social habits of the people, population pressures and crops and crop rotations that no economic planner can disregard. On the other hand, there is an inter-relation between the type of farm organization and the progressive ideology of urban-industrial culture ; and just as the village community or co-operative farming favours a decentralized type of industrial structure on the foundation of guilds and co-operatives, a State-controlled

system of industry favours collectivization in agriculture. Such issues are yet to emerge in the economics and politics of the field in India, though on these depend largely the procedures of planning. The most important thing in planning is to order the priorities and envisage the targets in the various fields according to the particular economic stage and social ideology of the people.

APPENDIX A

PILOT PROJECTS

Gwalior being an agricultural region with 86 per cent of the population living in villages, economic planning is largely agricultural and rural planning. The essence of such planning is that the developmental activities should be co-ordinated and linked together. Piecemeal and isolated programmes cannot make for success, especially since ancient custom and usage have to be fought down in the villages. Thus in any well-considered rural programme, improvement of agriculture, compulsory education, liquidation of adult illiteracy, health services, improvement of cattle, co-operative sale, consolidation of holdings, better living and social reform should all march hand in hand.

Broadly speaking, progress-mindedness in one direction is incompatible with conservatism and rigid adherence to obnoxious social custom and usage, that divide caste and caste and man and man. The success of economic planning depends to a great extent on the spirit of social equality in which the plan is envisaged and the spirit of idealism and service that administrators and public servants import into the implementing of the plan.

In full concurrence with the various Heads of Departments, I recommend to the Durbar the adoption of the following plan :

(1) An intensified programme of development covering a circle of 10 to 15 villages, in which activities of the Agriculture, Education and Forest Departments and the Medical and Veterinary Departments are concentrated and carefully co-ordinated for the improvement of the condition of the rural masses. This is an all-Gwalior programme and it will touch the rural life of the State at every facet. For its efficient implementing it is divided into four 5-year periods. No attempt is made to start this programme at once in all parts of the State. The programme will be start-

ed through what may be called *Pilot Projects*, in one circle of villages in Gwalior Prant and in another in Malwa Prant. The experience and the results of one year's work, and the checking of these by the different Departments in the light of standards or targets envisaged, will help towards the introduction of the 5-year Plan comprehensively throughout the State. When it is seen that satisfactory results are being achieved in the circle of 'Model Villages' under the supervision of the Heads of the various Departments concerned in the Plan, that itself will create a popular demand in the State for the extension of the Plan to other localities. These *Pilot Projects* have recently received the sanction of H. H. the Maharaja Scindia.

(2) Emergency schemes for special regions and problems :— Ravine formation in the north is the greatest single menace to Gwalior State. A scheme of establishment of two Soil Stabilization Circles in Bhind and Morena respectively is recommended.

Morena, Bhind, Gird, Sheopur and Sardarpur represent more or less in a descending order a black list of districts vulnerable to droughts and famines. The Harsi-Bhind canal system should be renovated so as to contribute towards the agricultural stability of especially insecure tracts. Certain tank irrigation famine projects that have been left incomplete or require renovation should be taken up as both protective and revenue-yielding works.

(3) A scheme of occupation and settlement of unoccupied chaks and blocks in certain districts.

(4) A scheme of progressive industrialization of Gwalior. This requires detailed mineral prospecting which will be taken up by geologists and surveys of forest, industrial resources and markets that will shortly be undertaken by economic and statistical investigators. The plans in this connexion will be submitted later.

It is, therefore, recommended that :

(i) Two planning centres be established, one in Gwalior and the other in Malwa Prant, as Pilot Schemes. The detailed estimates of non-recurring and monthly expendi-

ture are appended. For each centre the non-recurring expenditure will be Rs. 4,700, excluding a loan of Rs. 5,000 for the distribution of seeds ; and the yearly expenditure will be Rs. 11,614. The two Pilot Projects will cost Rs. 32,628 and will cover the various aspects of rural life and welfare for 30 villages. For this comprehensive scheme of uplift the estimated average cost would be about Rs. 1,088 per village and Rs. 6 per capita.

(ii) Two Soil Stabilization Circles be established in Bhind and Morena. The cost will be Rs. 4,500 non-recurring and Rs. 34,300 recurring.

(iii) The renovation of the Harsi-Bhind canal system and the completion or renovation of tanks formerly classified under Famine Relief projects should be executed. The cost will be Rs. 12 lakhs.

(iv) Unoccupied chaks and blocks in Guna, Shajapur and Sardarpur be taken up for improvement and planned colonization and development.

It may be pointed out that in so far as this Plan seeks to bring health service and facility of drinking-water supply to the door of the villager and is a systematic attempt towards village uplift, such funds as are already sanctioned for these purposes, viz. Rs. 18 lakhs allotted for provision of medical relief in villages, Rs. 5 lakhs for the construction of wells for drinking-water, as also the village uplift grants, could be utilized for the Plan. The Durbar may be graciously pleased also to allocate special funds for the post-War reconstruction work just as different States and Provinces in India have sanctioned regular budgets for this purpose.

ESTIMATES OF EXPENDITURE FOR THE PILOT PROJECTS

(A) Recurring Monthly Expenditure in each Planning Centre Consisting of a Circle of 10 to 15 Villages.

(1) Agricultural Development :

	Estimated expenditure per month.
(a) (i) One Agricultural Fieldman on Rs. 35+10 T. A. per month,	Rs. 45
(ii) Demonstration expenses on average farms situated in the midst of cultivator's holding, Rs. 15 p. m.	15
(b) Demonstration in four school gardens, Rs. 25 p. m.	25
	<hr/> 85 <hr/>

(2) Liquidation of Illiteracy :

(4 schools in a circle of 15 villages)

(1) One Head Teacher ..	Rs. 25 p. m.
(2) One Assistant Teacher. ..	Rs. 20 p. m.
(3) Milk supply to 50 boys at 2 as. per boy for 200 days in a year ..	Rs. 104 p.m.
(4) Bonus in a year at Rs. 2 per adult literate (about 25 in a year) to be paid to teachers. ..	Rs. 4-8-0 p.m.
Total monthly expenses for one school ..	Rs. 153-8-0 p.m.
For four Schools. ..	<hr/> 614 <hr/>

(3) Health Service :

(1) One Sanitary Assistant on Rs. 35+10 T. A..	45
(2) Two sweepers on Rs. 8 p. m. ..	16
(3) Subsidy to local Vaid, Hakim, or Allopathic Physician, at Rs. 25 p. m. ..	25
(4) Inam to local Dais for conducting labour cases at 8 as. per case (approximately 200 cases per annum) Rs. 8-5-4 p. m. ..	8 5 4
(5) Outfit allowance for local Dais Rs. 50 per annum or Rs. 4-8 p. m. (one Dai for each centre) ..	4 8 0
	<hr/> 98 13 4 <hr/>

(4) Cattle Improvement :

(1) One Veterinary Compounder for the treatment of village cattle diseases on Rs. 25 p. m. ..	25 0 0
(2) Stockman for castration on Rs. 35+10 p. m..	45 0 0
	<hr/> 70 0 0 <hr/>

(5) Co-operation :

One Secretary for multiple purpose society lending improved seeds and manures to cultivators, obtaining repayment in kind and selling the village produce, bringing about consolidation of holdings and co-operative farming, better living, etc. on Rs. 35 p.m.

35 0 0

 35 0 0

(6) Rural Afforestation :

Plantation of village groves. One Forest guard on Rs. 15 p. m. ..

15 0 0

 15 0 0

(7) Contingent expenditure on education, sanitation, agricultural improvement, recreation, etc. at Rs. 50 p. m. ..

50 0 0

 50 0 0

Grand total of estimated monthly recurring expenditure on each Centre ..

967 13 4

Estimated annual expenditure ..

 11,614 0 0

Note :—The resident organizer for each circle of 15 villages will be the Inspector of Agriculture in the district areas or the Demonstrator in Tehsil Headquarters.

The details of the above budget for each Planning Centre have been agreed to by the Heads of Departments of Agriculture, Education, Co-operation and Forests and of the Medical and Veterinary Departments.

(B) Details of Non-Recurring Expenditure for each Circle of 15 Villages.

(1) Improved agricultural implements and manures.

Rs. 500

(2) School building with equipment :—

(a) Building Rs. 1,500

(b) Equipment Rs. 500

 Rs. 2,000

2,000

(3) Medicines and equipment ..

200

(4) Veterinary instruments and medicines ..

200

(5) Well for drinking-water supply ..

1,500

(6) Loan of Rs. 5,000 to the Multiple-purpose Society for the distribution of seeds ..

(7) Afforestation ..

300

Total estimated non-recurring expenditure ..

 Rs. 4,700

These details have been agreed to by the various Heads of Departments concerned.

APPENDIX B

**SYNOPSIS OF SCHEMES INCLUDED IN THE DRAFT
PLAN OF POST-WAR RECONSTRUCTION AND
DEVELOPMENT IN GWALIOR STATE
CONSIDERED AND ARRANGED IN A
SCALE OF PRIORITIES IN THIS
REPORT**

KEY TABLE OF PRIORITIES

Serial Number	Subject of Planning & Name of Scheme	Serial Number of Scheme
<i>I. Planning Organization.</i>		
1.	Central Agency for Post-war Development work ..	22
2.	Training of Personnel	24
3.	Rural Development District Headquarters	44
<i>II. Protective Schemes.</i>		
4.	New Irrigation Works	106
5.	Tube-well Irrigation	107
6.	Anti-erosion Scheme	9
7.	Land Development, Improvement and Reclamation of Waste Lands	38
8.	Expansion of Veterinary Dispensaries	47
9.	Expansion of Civil Veterinary Department	48
10.	Subsidized Medical Practitioners	21
11.	Public Health Organizations	80
12.	Maternity and Child welfare Centres	31
13.	Epidemic Mobile Units	82
14.	Strengthening of Vaccination staff	83
<i>III. Schemes for Stability and Security of Subsistence and Employment.</i>		
15.	Expansion of the Co-operative Department	57
16.	Reorganization of Mandies	26
17.	Godowns in Market-Towns	60
18.	Improvement of Graining and Pasture Lands	52
<i>IV. Training Schemes for the inauguration of developmental programmes.</i>		
19.	Training of Primary School Teachers	16
20.	Training of Nurses, etc.	20
21.	Establishment of Institutions of Fine Arts	28
22.	Increase of Audit Staff	58
<i>V. Developmental Schemes. 'A' Improvement of land utilization</i>		
23.	Re-settlement of ex-servicemen in agriculture,	1
24.	Establishment of District Experimental Farms	39
25.	Village Demonstration Centres	40
26.	Improved Varieties of seeds	41
27.	Sale of Improved seeds and manures	42
28.	Composting forest and farm wastes	56
29.	Revival of the Agricultural Engineering Section	35
30.	Organization of Horticulture Section	37

Serial Number	Subject of Planning & Name of Scheme	Serial Number of Scheme
31.	Reorganization of Agricultural Department	34
32.	Expansion of Agricultural Research	36
33.	Cultivation of fodder crops	108
34.	Expansion of areas under cash crops	109
35.	Re-forestation of Denuded Tracts	10
36.	Re-organization of Forest Services	55
37.	Forest Rehabilitation	49
38.	Afforestation	51
39.	Forest Research	54
<i>'B' Education</i>		
40.	Introduction of compulsory Primary Education ..	15
41.	Vernacular & Double Upper Primary Education ..	72
42.	Education for Forest Tribes	116
43.	Central Schools for Bhils & Bhilalas	117
<i>'C' Economic Organization</i>		
44.	Central Research Institute	96
45.	Loans to Agriculturists	43
46.	Co-operative Apex Bank	62
47.	Revival of Bull Breeding Farm	45
48.	Cottage Industries	27
49.	Sheep and Goat Improvement Schemes	46
50.	Poultry Farming	110
51.	Village Forest Development Scheme	50
52.	New Types of Co-operative Societies	59
53.	Elimination of persons with large income from the Agri- cultural Credits Societies	61
<i>'D' Improvement of Health, Culture and the amenities of life</i>		
54.	Provision for increasing the number of beds in Civil Hospitals and Dispensaries	87
55.	Improvement of Villages	93
56.	Establishment of Radio Broadcasting	63
57.	Hospitals for Invalids, Lepers, and Chronic Cases ..	89
58.	Anti-Malaria Measures	118
59.	Establishment of Venereal Clinics	119

1. Planning Organization :

SCHEME No. 22

Central Agency for post-War development work :

Under this scheme 1 Development Commissioner and 3 Assistant Development Commissioners will be appointed for carrying on the work of post-War reconstruction.

Expenditure :—Details are being worked out.

SCHEME No. 24

Training of Personnel :

The scheme provides for (1) training of 15 technicians in foreign countries, (2) study-tours of officers in foreign countries, (3) training of upper and lower technical personnel in India, and (4) establishment of Institutes for the training of subordinate staff of the various development departments.

Expenditure :—

Capital, Nil.

Recurring, Rs. 7 lakhs.

Total, Rs. 7 lakhs.

SCHEME No. 44

Rural Development District Headquarters :

The scheme provides for the appointment of a Development Officer in each district, which will be divided into units of 50 villages each. A unit will be looked after by an Assistant Development Officer for concerted drive in all aspects of intensive rural development work. The organization is proposed for two years only.

Expenditure :—

Capital, Rs. 0.04 lakh.

Recurring, Rs. 4.97 lakhs.

Total, Rs. 5.01 lakhs.

II. Protective Schemes :

SCHEME No. 106

New Irrigation Works :

Provision has been made under the scheme for supplementing Harsi Dam, Paniar Stop Dam, Chentikhera Kuari Project, Dokar-ka-Tank, Ramana Reservoir and improvement in the Distributary system of Harsi and Bhind canals.

Expenditure :—

Capital, Rs. 220 lakhs.

Recurring, —

Total, 220 lakhs.

SCHEME No. 107

Tube-well Irrigation :

It is proposed to sink 6 deep tube-wells every year in selected localities in the Bhind and Morena districts. Each tube-well will irrigate about 100 acres of crop.

Expenditure :—

Capital, Rs. 8.40 lakhs.

Recurring, Rs. 1.67 lakhs.

Total, Rs. 10.07 lakhs.

SCHEME No. 9

Anti-erosion Scheme :

To check erosion and reclaim land from ravines, work will be started at 5 centres each in the districts of Bhind and Morena. Each centre will comprise 200 acres. Fresh plantations, gully-plugging and bunding will be undertaken at these centres.

Expenditure :—

Capital, Rs. 5.75 lakhs.

Recurring, Rs. 2.10 lakhs.

Total, Rs. 7.85 lakhs.

SCHEME No. 38

Land Development, Improvement and Reclamation of Waste Lands :

The scheme contemplates the establishment of experimental centres in selected areas for the application of land improvement measures to prevent erosion in the districts of Bhind and Morena and for reclamation work in the districts of Sheopur, Shivpuri and Guna.

Expenditure :—

Capital, Rs. 3 lakhs.

Recurring, Rs. 3·82 lakhs.

Total, Rs. 6·82 lakhs.

SCHEME No. 47***Expansion of Veterinary Dispensaries :***

It is proposed to replace the existing 16 first-aid dispensaries by veterinary dispensaries in pargana towns and shift the former to other towns.

Expenditure :—

Capital, Nil.

Recurring, Rs. 0·2 lakh.

Total, Rs. 0·2 lakh.

SCHEME No. 48***Expansion of the Civil Veterinary Department :***

The scheme provides for additional staff to check the field work and see to the enforcement of Live-stock Improvement Act.

Expenditure :—

Capital, Rs. 500

Recurring, Rs. 45,700

Total, Rs. 46,200

SCHEME No. 21***Subsidized Medical Practitioners :***

It is proposed to open 30 subsidized medical centres (6 Allopathic and 24 Ayurvedic and Unani) in remote rural areas in the course of five years. The subsidy will be at the rate of Rs. 960 per annum for Allopathic practitioners and Rs. 600 per annum for others including in each case the grant for medicines.

Expenditure :—

Capital, Nil.

Recurring, Rs. 1·008 lakhs.

Total, Rs. 1·008 lakhs.

SCHEME No. 80

Public Health Organization :

It is proposed to appoint a Director of Public Health and organize a Public Health Department. Five Sanitary Inspectors and 5 Assistant Inspectors will be appointed for sanitary survey of villages.

Expenditure :—

Capital, Rs. 0·10 lakh.

Recurring, Rs. 2·50 lakhs.

Total, Rs. 2·60 lakhs.

SCHEME No. 81

Maternity and Child Welfare Centres :

Provision is made to set up more maternity and child welfare centres so as to have ultimately a centre at each district and pargana headquarters.

Expenditure :—

Capital, Rs. 0·435 lakh.

Recurring, Rs. 1·445 lakhs.

Total, Rs. 1·88 lakhs.

SCHEME No. 82

Epidemic Mobile Units :

The scheme makes provision for the establishment of six epidemic mobile units, each consisting of one Sub-Assistant Surgeon, one Compounder and Vaccinator, one Motor-driver and one Cleaner.

Expenditure :—

Capital, Rs. 0·18 lakh.

Recurring, Rs. 4·37 lakhs.

Total, Rs. 4·55 lakhs.

SCHEME No. 83

Strengthening of Vaccination Staff :

It is estimated that rural areas require about 120 vaccinators, while at present there are only 73. The scheme provides for the appointment of 16 more vaccinators.

Expenditure :—

Capital, Rs. 0·01 lakh.

Recurring, Rs. 0·25 lakh.

Total, Rs. 0·26 lakh.

III. Schemes for Stability and Security of Subsistence and Employment :

SCHEME No. 57

Expansion of the Co-operative Department :

It is proposed to strengthen the present staff by 2 Deputy Registrars, 1 Banking Assistant, 1 Industrial Assistant and 2 Assistants to the Deputy Registrar.

Expenditure :—

Capital, Rs. 0·04 lakh.

Recurring, Rs. 1·66 lakhs.

Total, Rs. 1·70 lakhs.

SCHEME No. 26

Reorganization of Mandies (Regulated Markets) :

It is proposed to appoint Government secretaries with other necessary staff in the regulated markets and build granaries on co-operative basis in each such Mandi. The scheme also contemplates the establishment of demonstration farms, co-operative banks, hospitals, veterinary dispensaries and other educative agencies in these Mandies.

Expenditure :—

Capital, Rs. 37 lakhs.

Recurring Rs. 8·61 lakhs.

Total, Rs. 45·61 lakhs.

SCHEME No. 60

Godowns in Market-Towns :

It is proposed to build at Government cost godowns in market-towns for the use of co-operative societies. The cost will be recovered over a period of 20 years. Government has already sanctioned Rs. 50,000 for the purpose.

Expenditure :—

Capital, Rs. 0·50 lakh.

Recurring, —
Total, Rs. 0·50 lakh.

SCHEME No. 52

Improvement of grazing and pasture lands :

The appointment of a Soil Conservation Officer is contemplated under this scheme as also allotting rotational area for grazing in each district, developing pasture lands on scientific lines and enforcing stall feeding.

Expenditure :—

Capital, Rs. 0·15 lakh.
Recurring, Rs. 1·15 lakhs.
Total, Rs. 1·30 lakhs.

IV. Training Schemes for the Inauguration of Developmental Programmes :

SCHEME No. 16

Training of Primary School Teachers :

The scheme contemplates the starting of two normal schools, one at Sabalgarh and the other at Agar, for training teachers of primary and double primary schools.

Expenditure :—

Capital, Rs. 0·70 lakh.
Recurring, Rs. 0·90 lakh.
Total, Rs. 1·60 lakhs.

SCHEME No. 20

Training of Nurses, etc :

Under this scheme 30 nurse's, 10 compounders, 2 health visitors, 2 midwives and 10 dais will be trained every year. Each candidate will receive a fixed scholarship and boarding and uniform allowance during the period of training.

Expenditure :—

Capital, Nil.
Recurring, Rs. 1·12 lakhs.
Total, Rs. 1·12 lakhs.

SCHEME No. 28

Establishment of Institutions of Fine Arts :

Two institutions, one at Lashkar and the other at Ujjain to train students in drawing, painting, sculpture, engraving and metal works are contemplated under the scheme with a view to meet the requirements of new industries.

Expenditure :—

Capital, Rs. 0·9 lakh.

Recurring, Rs. 1·2 lakhs.

Total, Rs. 2·1 lakhs.

SCHEME No. 58

Increase of Audit Staff :

It is provided to increase the number of Auditors by twenty.

Expenditure :—

Capital, Rs. 0·04 lakh.

Recurring, Rs. 0·80 lakh.

Total, Rs. 0·84 lakh.

V. Developmental Schemes :

(a) *Improvement of land utilization :—*

SCHEME No. 1

Re-settlement of ex-servicemen in agriculture :

It is proposed to allot plots to discharged soldiers at an average rate of 15 to 20 bighas each on ryotwari tenure together with a loan of Rs. 500 for bullocks etc. Separate colonies with adequate provision for education, sanitation and other amenities will be established for these soldiers.

Expenditure :—

Capital, Rs. 5 lakhs.

Recurring, Rs. 4·40 lakhs.

Total, Rs. 9·40 lakhs.

SCHEME No. 39

Establishment of District Experimental Farms :

At present, there are experimental farms in three dis-

tricts only. Under this scheme experimental farms will be established in the remaining eight districts as well.

Expenditure :—

Capital, Rs. 3 lakhs.

Recurring, Rs. 3·82 lakhs.

Total, Rs. 6·82 lakhs.

SCHEME No. 40

Village Demonstration Centres :

It is proposed to establish 100 demonstration centres in selected villages in the first five years. Demonstration will be conducted on the cultivator's own plots under the direction of the officers of the Agriculture Department. At each centre a store for the supply of seed and implements will also be established.

Expenditure :—

Capital, Rs. 0·57 lakh.

Recurring, Rs. 0·33 lakh.

Total, Rs. 0·90 lakh.

SCHEME No. 41

Improved Varieties of Seeds :

It is proposed to produce and multiply the improved variety of seed from Government and subsidized farms and eventually cover an area of one lakh bighas in five years.

Expenditure :—

Capital, Rs. 1·78 lakhs.

Recurring, Nil.

Total, Rs. 1·78 lakhs.

SCHEME No. 42

Sale of Improved Seeds and Manure :

The scheme provides for a sum of Rs. 3 lakhs per annum for five years for subsidized sale of improved seeds and manure.

Expenditure :—

Capital, Rs. 15 lakhs.

Recurring, Rs. 3·75 lakhs.

Total, Rs. 18·75 lakhs.

SCHEME No. 56

Composting Forest and Farm Waste :

By training staff in composting work under Bio-chemists to be appointed, it is proposed to hold demonstrations in the villages.

Expenditure :—

Capital, Rs. 0·10 lakh.

Recurring, Rs. 0·37 lakh.

Total, Rs. 0·47 lakhs.

SCHEME No. 35

Revival of the Agricultural Engineering Section :

The establishment of an engineering section and a fully equipped workshop is contemplated to design and manufacture improved agricultural implements, advise on the use of tractors, maintain two sets of tractors for lending, and sink tube-wells, etc.

Expenditure :—

Capital, Rs. 3·95 lakhs.

Recurring, Rs. 2·61 lakhs.

Total, Rs. 6·56 lakhs.

SCHEME No. 37

Organization of Horticulture Section :

It provides for the development and extension of fruit and vegetable cultivation by (a) provision of specialized staff for carrying out research and (b) the establishment of nurseries for supplying improved seeds and grafts to the cultivators.

Expenditure :—

Capital, Rs. 0·70 lakh.

Recurring, Rs. 0·95 lakh.

Total, Rs. 1·65 lakhs.

SCHEME No. 34

Reorganization of the Agricultural Department :

It is proposed to strengthen the superior supervising staff, to raise its salary on a permanent basis and to augment staff in the districts to enable the work of the Depart-

ment to be carried out efficiently in the interior of each district.

Expenditure :—

Capital, Rs. 1 lakh.

Recurring, Rs. 9·95 lakhs.

Total, Rs. 10·95 lakhs.

SCHEME No. 36

Expansion of Agricultural Research :

It is proposed to provide additional staff and equipment for various research sections including the appointment of Plant Pathologists, Entomologists and Crop Botanists.

Expenditure :—

Capital, Nil.

Recurring, Rs. 1·95 lakhs.

Total, Rs. 1·95 lakhs.

SCHEME No. 108

Cultivation of Fodder Crops :

The scheme makes provision for the extension of the cultivation of fodder crops by free distribution of seeds and grant of subsidy in selected areas.

Expenditure :—

Capital, —

Recurring, Rs. 1·15 lakhs.

Total, Rs. 1·15 lakhs.

SCHEME No. 109

Expansion of areas under Cash Crops :

On the same lines as scheme No. 108.

Expenditure :—

Capital, —

Recurring, Rs. 2·50 lakhs.

Total, Rs. 2·50 lakhs.

SCHEME No. 10

Re-forestation of Denuded Tracts :

It is proposed to take up blocks of Reserved forests in Gird, 5 in Sheopur and 4 in Morena for filling up the de-

nuded tracts with useful species like wattles and *prosopis juliflora*, etc.

Expenditure :—

Capital, Rs. 1·67 lakhs.

Recurring, Rs. 0·65 lakh.

Total, Rs. 2·32 lakhs.

SCHEME No. 55

Reorganization of Forest Service :

The scheme aims at strengthening the Forest staff to cope with the increased volume of work and raise salaries of existing posts to attract qualified hands.

Expenditure :—

Capital, —

Recurring, Rs. 4·736 lakhs.

Total, Rs. 4·736 lakhs.

SCHEME No. 49

Forest Rehabilitation :

It is proposed to carry out survey, mapping and stock-taking of the forest crop with a view to plan for increased fuel yield from the hitherto unexplored forests.

Expenditure :—

Capital, Rs. 0·40 lakh.

Recurring, Rs. 1·50 lakhs.

Total, Rs. 1·90 lakhs.

SCHEME No. 51

Afforestation :

Provision is made under the scheme for raising compensatory and irrigated plantations of the species economically valuable in industries, in places where irrigation water will be available. It is anticipated that 3,000 acres will thus be planted.

Expenditure :—

Capital, Rs. 2·0 lakhs.

Recurring, Rs. 1·20 lakhs.

Total, Rs. 3·20 lakhs.

SCHEME No. 54

Forest Research :

A silviculturist is proposed to be appointed to carry on forest research in collaboration with the central silviculturist.

Expenditure :—

Capital, Rs. 0.12 lakh.

Recurring, Rs. 1.20 lakhs.

Total, Rs. 1.32 lakhs.

(b) *Education :*

SCHEME No. 15

Compulsory Primary Education :

It provides for compulsory primary education in the towns of Lashkar, Gwalior, Morar and Ujjain in the course of a five-year plan.

Expenditure :—

Capital, Rs. 3 lakhs.

Recurring, Rs. 1 lakh.

Total, Rs. 4 lakhs.

SCHEME No. 72

Vernacular and Double Upper Primary Education :

Provision is made to give definite vocational bias to students in rural schools by introducing such subjects as handicrafts, homecrafts, etc.

Expenditure :—

Capital, —

Recurring, Rs. 0.75 lakh.

Total, Rs. 0.75 lakh.

SCHEME No. 116

Education of Forest Tribes :

Under this scheme 10 schools will be started for the training of Sahariyas, Moghas, Bhils and Minas in carpentry, hand-loom, button manufacture, turnery, tanning of leather, rope twining, etc. in Guna, Shivpuri and Sardarpur.

Expenditure :—

Capital, Rs. 0·50 lakh.

Recurring, Rs. 0·85 lakh.

Total, Rs. 1·35 lakhs.

SCHEME No. 117

Schools for Bhils & Bhilalas :

Three central schools for backward tribes are proposed to be established in the Districts of Sardarpur and Sheopur.

Expenditure :—

Capital, Rs. 0·20 lakh.

Recurring, Rs. 0·67 lakh.

Total, Rs. 0·87 lakh.

(c) *Economic Organization*

SCHEME No. 96

Central Industrial Research Institute :

The scheme provides for the establishment of a Central Industrial Research Institute to carry out research work in relation to industries. Small Research Laboratories will be set up at all the important centres of cottage industries under the aegis of this Institute. It will be a semi-official concern and the capital as well as the recurrent cost will be contributed by big industrialists of the State.

Expenditure :—

Capital, Rs. 3 lakhs.

Recurring, Rs. 1·35 lakhs.

Total, Rs. 4·35 lakhs.

SCHEME No. 43

Loans to Agriculturists :

A fund of Rs. 25 lakhs has been set apart for the provision of cheap rural credit through Government agency in villages where there are no co-operative societies.

Expenditure :—

Capital, Rs. 25 lakhs.

Recurring, Rs. 1 lakh.

Total, Rs. 26 lakhs.

SCHEME No. 62

Co-operative Apex Bank :

The scheme, which has already been sanctioned, makes provision for the organization of an Apex Bank, which will be allowed to float debentures on Government guarantee. The Bank will have a capital of Rs. 5 lakhs and will also advance long-term loans to land mortgage societies, housing societies, co-operative stores, etc.

Expenditure :—

Capital, Rs. 5·00 lakhs.

Recurring, Rs. 0·30 lakh.

Total, Rs. 5·30 lakhs.

SCHEME No. 45

Bull Breeding Farms :

Central Bull Breeding Farms are proposed to be established at Gwalior, Guna and Ujjain with 100 selected cows and 3 thoroughbred bulls at each place.

Expenditure :—

Capital, Rs. 1·35 lakhs.

Recurring, Rs. 6·2 lakhs.

Total, Rs. 7·55 lakhs.

SCHEME No. 27

Cottage Industries :

After an industrial Survey steps will be taken to expand and revivify cottage industries; there will be Cottage Industries Centres at the district headquarters and the parganas equipped with small Research Laboratories. At each such Centre the Research Assistant and the Designer will try to find and propagate means of raising productive efficiency of the local cottage industries, while the technical teachers will give training and undertake demonstrations. Arts and Crafts Emporia will also be established at these centres. Provision of finance at cheap rates is contemplated through the establishment of private companies of village sahumars with a State guarantee of a reasonable rate of interest on their investments.

Expenditure :—

Capital, Rs. 1·3 lakhs.

Recurring, Rs. 7·6 lakhs.

Total, Rs. 8·9 lakhs.

SCHEME No. 46

Sheep and Goat Improvement :

With a view to improve the quality and quantity of mutton, investigate cattle diseases, improve the quality of fleece, and to increase milk yield of goats, it is proposed to start work in Shivpuri, Morena, Gwalior, Bhind and Mandsaur.

Expenditure :—

Capital, Rs. 0·14 lakh.

Recurring, Rs. 0·64 lakh.

Total, Rs. 0·78 lakh.

SCHEME No. 110

Poultry Farming :

The scheme provides for the establishment of a Government Poultry Farm.

Expenditure :—

Capital, Rs. 0·46 lakh.

Recurring, Rs. 0·28 lakh.

Total, Rs. 0·75 lakh.

SCHEME No. 50

Village Forest Development Scheme :

The scheme aims at developing 25 centres of 20 acres each of waste lands in villages in five districts, which have little or no forests with plantations of fast-growing fuel and small-timber species. Thus 2,500 acres of land will be planted annually for these purposes.

Expenditure :—

Capital, Rs. 3·275 lakhs.

Recurring, Rs. 1·525 lakhs.

Total, Rs. 4·80 lakhs.

SCHEME No. 59

New Types of Co-operative Societies :

The scheme provides for the organization of co-operative farms, consolidation of holdings, irrigation, marketing, etc.

Expenditure :—

Capital, Rs. 0·04 lakh.

Recurring, Rs. 1·38 lakhs.

Total, Rs. 1·42 lakhs.

SCHEME No. 61

Elimination of persons with large incomes from the Agricultural Credit Societies :

The scheme provides for the transfer of the debts of the large-scale cultivators from the co-operative societies to the Banks at a reduced rate of 3 per cent.

Expenditure :—

Capital, —

Recurring, Rs. 0·50 lakh.

Total, Rs. 0·50 lakh.

(d) *Improvement of Health, Culture and the amenities of Life*

SCHEME No. 87

Provision for increasing the number of Beds in Civil Hospitals and Dispensaries :

It is proposed to increase the number of beds by 72 in 13 hospitals in the mofussil.

Expenditure :—

Capital, Rs. 0·72 lakh.

Recurring, Rs. 0·037 lakh.

Total, Rs. 0·757 lakh.

SCHEME No. 93

Improvement of Villages :

The scheme contemplates the demolition of some 100 villages within one mile on either side of the Agra-Bombay road and construct new villages in their stead. The

new villages will consist of brick houses and provision will be made for general amenities and sanitation enabling the inhabitants to grow in healthy surrounding.

Expenditure :—

Capital, Rs. 27.50 lakhs.

Recurring, —

Total, Rs. 27.50 lakhs.

SCHEME No. 63

Radio Broadcasting :

The scheme provides for the establishment of a 5 k.w. Medium-Wave Station and a 10 k.w. Short-Wave Transmitter at Gwalior and a 2.5 k.w. Medium-Wave Relay Station at Ujjain.

Expenditure : Capital, Rs. 3.345 lakhs ; Recurring, Rs. 3.21 lakhs ; Total, Rs. 6.555 lakhs.

SCHEME No. 89

Hospital for Invalids, Lepers and Chronic Cases :

This hospital will be established at Lashkar and a grant of Rs. 1.30 lakhs has already been made for the purpose.

Expenditure : Capital, Rs. 1.30 lakhs ; Recurring, Rs. 1.27 lakhs ; Total, Rs. 2.57 lakhs.

SCHEME No. 118

Anti-malarial Measures :

One anti-malaria unit for the purpose of investigations and control measures is proposed to be established.

Expenditure : Capital, Rs. 0.041 lakh ; Recurring, Rs. 0.343 lakh ; Total, Rs. 0.384 lakh.

SCHEME No. 119

Establishment of Venereal Clinics :

The scheme provides for the establishment of venereal clinics at Gwalior and Ujjain.

Expenditure : Capital, Rs. 0.30 lakh ; Recurring, Rs. 1.336 lakhs ; Total, Rs. 1.636 lakhs.

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The Rural Economy of India

(Longmans)

"It is a valuable and eminently sane contribution to the discussion."—*The Times Literary Supplement*.

Borderlands of Economics

(George Allen & Unwin)

"Worth a serious perusal, for here economics are viewed from a pinnacle of learning which commands an encyclopaedic horizon. A book crammed with thought and thought-compelling."—*The Star*.

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Regional Sociology

(Century Social Sciences Series, New York)

".... Mukerjee's regional sociology outlines in fact a program of scientific studies more comprehensive than anything else that has yet been attempted in this field..... The geographical region and the web of life within that region have been made the subject of a new division of the social sciences."—*The American Journal of Sociology*.

The Economic History of India, 1600—1800

(Longmans)

"Here are the familiar qualities of Mukerjee's works..... documented details and objective scholarship. The material as well as the fresh approach in this book are indispensable to a future author of a People's History of India, which is sorely needed to throw out much of the rubbish contained in the current school texts."—*Asia*.

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